United States
Department of
Agriculture

Forest
Service

North Central
Forest Experiment
Station

Resource
Bulletin **NC-64**

Timber Resource of Michigan's Eastern Upper Peninsula, 1980

W. Brad Smith

Information contained in this report includes the most commonly used Resources Evaluation statistics. However, additional forest resource data can be provided to interested users. Persons requesting additional information that can be provided from the raw inventory data are expected to pay for the retrieval costs. These costs will vary depending on the complexity of the request, from less than $100 for a relatively simple request to $2,000 for a complex retrieval involving the services of a Resources Evaluation computer programmer. Requests for data that conflict with ongoing Resources Evaluation work will be scheduled to minimize their impact on the work unit.

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Manuscript approved for publication October 29, 1981
1982

FOREWORD

Resources Evaluation (formerly called Forest Survey) is a continuing endeavor as mandated by the Forest and Rangeland Renewable Resources Planning Act of 1974, which was preceded by the McSweeney-McNary Forest Research Act of 1928. Its objective is to periodically inventory the Nation's forest land to determine its extent, condition, and volume of timber, growth, and depletions. This kind of up-to-date information is essential to frame intelligent forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual States. The North Central Forest Experiment Station is responsible for Resources Evaluation work done in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, and Wisconsin.

Fieldwork for the 1980 Eastern Upper Peninsula forest inventory began in January 1978 and was completed in July 1980. Reports on the three previous surveys of Michigan's timber resource are dated 1935, 1955, and 1966. Similar Resource Bulletins reporting statistical highlights and detailed tables on the other Survey Units in Michigan (see cover) are or soon will be available. In addition to these statistical reports, a series of reports will be published that will analyze the State's timber resources.

More accurate survey information was obtained during the 1980 survey than otherwise would have been feasible because of intensified field sampling. Such sampling was made possible by additional funding and manpower provided the North Central Station through the Michigan Department of Natural Resources and by interested forest industry members. Data from the Department's canvass of all primary wood-using plants in the State was used to help estimate the quantity of timber products harvested in Michigan.

Aerial photos used in the Eastern Upper Peninsula Forest Inventory were furnished by the Michigan Department of Natural Resources.

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TIMBER RESOURCE OF MICHIGAN'S EASTERN UPPER PENINSULA, 1980

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Mensurationist

HIGHLIGHTS

Forest Area

- Forest land accounted for 4.0 million acres (81 percent of the Unit's land area) in 1980 compared to 4.3 million acres (85 percent) in 1966.
- Commercial forest land occupied 3.8 million acres (95 percent of the forest land) in 1980 compared to 4.2 million acres (97 percent) in 1966—a 9 percent decline.
- Productive-reserved forest land totaled 128,000 acres in 1980 compared to 33,000 acres in 1966.
- Chippewa County contained the largest area of commercial forest in 1980 (706,000 acres) as it did in 1966 (766,000 acres).
- Nonindustrial private parties owned 1.4 million acres (37 percent of the commercial forest) in 1980 compared to 1.5 million acres (36 percent) in 1966.
- The maple-birch forest type continues to dominate the commercial forest, representing 31 percent of the total in 1980 compared to 29 percent in 1966.
- Thirty-six percent of the privately owned commercial forest has been owned by its present owner 20 years or more.
- Poletimber stands occupied 48 percent of the commercial forest in 1980 as compared to 43 percent in 1966.
- Sawtimber stands—the area of which declined by 33,000 acres between surveys—amounted to 26 percent of the commercial forest in 1980 compared to 25 percent in 1966.

Timber Volume

- The volume of growing stock in 1980 was 4.0 billion cubic feet, 19 percent greater than the 3.4 billion[1] in 1966, in spite of the 9 percent loss of commercial forest land between surveys.
- Sawtimber volume amounted to 9.4 billion board feet[2] in 1980.
- Softwoods make up 43 percent of the growing-stock volume.
- Northern white-cedar (585 million cubic feet), sugar maple (574 million cubic feet), red maple (524 million), and quaking aspen (409 million) contain the highest volumes and together account for more than half of the growing-stock volume.
- Average growing-stock volume per acre in 1980 was 1,061 cubic feet (13.4 cords) compared to 816 cubic feet (10.3 cords) in 1966.
- Thirty-nine percent of the growing-stock volume is in the northern hardwoods forest type.
- Nearly half of the growing stock volume is on public land.
- The volume in cull trees (rough, rotten, and short-log cull) is 332 million cubic feet; salvable dead tree volume is 167 million cubic feet.

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[1]*Published 1966 volumes were adjusted by factors derived from 1980 volume equations for the two inventories comparable.*

[2]*International ¼-inch rule.*

Stand Conditions

- Net annual growth on growing-stock trees was 132 million cubic feet in 1979 compared to 101 million in 1965.
- The net annual growth rate of growing stock was 3.3 percent of inventory in 1979 compared to 3.0 percent in 1965.
- Net growth averaged 34.8 cubic feet per acre in 1979—24.3 cubic feet per acre in 1965.
- Annual mortality of growing stock amounted to 41 million cubic feet (1.0 percent of inventory) in 1979, compared to 32 million (0.9 percent of inventory) in 1965.
- Disease accounted for 36 percent of the mortality in 1979—chiefly diseases of aspen and elm.
- Fifty-nine percent of the commercial area is capable of growing trees 51 feet and taller at age 50, and 13 percent of the area can grow trees 71 feet and taller at the same age.
- Stands aged 50 years or less declined from 59 percent of the commercial area in 1966 to 49 percent in 1980.

Timber Use

- Timber removals from growing stock in 1979 amounted to 54 million cubic feet (1.4 percent of inventory) compared to 48 million cubic feet (1.4 percent of inventory) in 1965.
- Alger County accounted for 20 percent of the 1979 removals, followed by Menominee County (18 percent) and Luce County (17 percent).
- The maples made up 30 percent of the 1979 removals volume, with soft maple removals increasing 267 percent since 1965.
- Output of timber products totaled 50 million cubic feet in 1978, 61 percent of which was pulpwood.
- In 1978, 86 percent of the 6.9 million cubic feet of wood residue from primary plants was used.

Biomass

- Live shrub biomass (including trees less than 1 inch d.b.h.) was highest in the tamarack forest type where it amounted to 2.0 tons per acre (green weight) in 1980.
- Live tree biomass (trees greater than 1 inch d.b.h.) totaled 220 million green tons (an average of 58 tons per acre) in 1980.
- Highest yields of live tree biomass (green weight) are in the exotic forest type (85 tons per acre), the maple-birch type (76 tons), the northern white cedar type (62 tons), and the white spruce type (58 tons).

APPENDIX

Accuracy of Survey

Resources Evaluation information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit levels. Consequently, the reported figures are only estimates. A measure of reliability of these figures is given by sampling errors. These sampling errors mean that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated.

For example, the estimated growing-stock volume in the Eastern Upper Peninsula Unit in 1980, 4,034.7 million cubic feet, has a sampling error of ± 1.39 percent (± 56.1 million cubic feet). The growing-stock volume from a 100-percent inventory, then, would be expected to fall between 4,090.8 and 3,978.6 million cubic feet (4,034.7 ± 56.1), there being a one in three chance that this is not the case.

The following tabulation shows the combined sampling errors for the 1980 Eastern Upper Peninsula Forest Inventory:

Item	Unit totals	Sampling error
Growing stock	(Million cubic feet)	(Percent)
Volume	4,034.7	1.39
Growth	132.2	2.68
Removals	54.5	13.50
Sawtimber	(Million board feet)	
Volume	9,395.2	2.11
Growth	447.3	3.74
Removals	172.3	17.80
Commercial forest land	(Thousand acres)	
	3,801.6	0.48

As survey data are broken down into sections smaller than State or Survey Unit totals, the sampling error increases. The smaller the breakdown, the larger the sampling error. For example, the sampling error for growing-stock volume in a particular county is higher than that for total growing-stock volume in the Survey Unit (table 74 shows the sampling errors for estimates smaller than Unit totals).

SURVEY PROCEDURES

The major steps in the survey of the Eastern Upper Peninsula Unit were as follows:

1. A total of 21,176 1-acre points were systematically distributed across aerial photos of the entire Unit, except the Hiawatha National Forest. These points were classified into land classes as shown below to make a preliminary estimate of forest area. Next, 16,767 of these points were stereoclassified as to forest type, stand-size class, and density. Finally, 2,613 points were examined on the ground to correct the preliminary area estimate for errors in classification and for actual changes in land use since the photos were taken.

	Photo points		Ground plots visited
	Classified	Stereoclassified	
Forest land	16,585	16,585	2,041
Unproductive forest land	112	112	14
Nonforest land			
With trees	144	18	18
Without trees	3,744	0	467
Water	539	0	66
Questionable	52	52	7
Total	21,176	16,767	2,613

At each of the forest ground check locations, variable-radius plots (basal area factor 37.5) were established at 10 points uniformly placed over the sample acre. Tree measurements made at these locations and at 141 plots established in 1966 and remeasured in 1980 were the basis for estimates of timer volume, growth, mortality, number of trees, and other forest classifications on land other than National Forest land. The National Forest procedure is discussed in item 3.

2. Growth and mortality on all commercial forest land were estimated using the STEMS[3] after it was adjusted with factors derived from the 1979 remeasurement of permanent sample plots in the Upper Peninsula that were established in 1965. STEMS is an individual tree-growth projection system that uses the following stand and tree characteristics to "grow" trees by updating tree diameter and tree status (live, dead, or cut): species, tree diameter, crown ratio, site index, basal area, and average stand diameter. These characteristics were used to produce growth and mortality rates that were adjusted based on ground

[3]*Stand and Tree Evaluation Modeling System. For more information on STEMS, see: Belcher, D. L., Holdaway, M. R.; Brand, G. J. STEMS: The stand and tree evaluation and modeling system. Gen. Tech. Rep. NC-79. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; (In prep.). p.*

conditions gained from remeasurement of plots and applied to trees on the tree list to yield an updated tree list. Local volume equations were applied to the original and updated tree lists to estimate volumes of growth and mortality.

3. The Hiawatha National Forest provided the Station with the area of commercial forest land by forest type, stand-size class and density for the Forest, and cubic foot removals by species since 1976. One hundred twenty-seven plots measured in 1976 were then updated with STEMS to provide estimates of current volume, growth, and mortality for the Forest. Area and volume tables for the National Forest were approved by the Hiawatha National Forest staff before publication.

4. Statistics on timber utilization during l978 were obtained from mill surveys. The Michigan Department of Natural Resources canvassed resident sawmills, veneer mills, and other primary wood-using plants. The North Central Forest Experiment Station canvassed out-of-State sawmills, pulpmills, and veneer mills to determine their use of Michigan timber. Fuelwood and fencepost output were based on a sample of public and private landowners to determine their production of fuelwood and fenceposts and on a canvass of industrial and public timber owners. Estimates of primary mill residue used for fuelwood were obtained from the canvass of Michigan primary wood-using plants. Timber cut for products by ownership class was determined by a canvass of public and industrial timber owners. The portion of timber cut unaccounted for by the latter owners was grouped under "farmer and other owners."

5. A total of 2,239 felled trees on 123 active logging operations were measured throughout the State during 1977 and 1978 to develop wood utilization factors for converting timber products output to timber removals for saw logs and pulpwood. Factors for all other products were obtained during the 1964 and 1965 Michigan utilization study.

6. Field data were compiled and analyzed.

COMPARING MICHIGAN'S FOURTH INVENTORY WITH THE THIRD INVENTORY

Data from new forest inventories are often compared with data from earlier inventories to determine trends in timber volumes. Changes in procedures and definitions between surveys make it necessary to adjust earlier survey data so that they are comparable to data from the new survey. A consistency check was made for each Forest Survey Unit in Michigan to ensure that the changes observed between inventories reflect actual changes in the resource and not changes in definitions or procedures.

In Michigan's Eastern Upper Peninsula Unit definitional or procedural changes between the 1966 and 1980 inventories included the procedures for determining the area of nonforest land by land class, the number of trees by 2-inch diameter class, and the volume equations.

In the 1966 forest inventory, the 1964 Census of Agriculture estimates of cropland and pasture and rangeland areas were used in the inventory report tables. For the 1980 inventory, we estimated cropland, pasture, and rangeland from aerial photos. The published 1966 estimates of cropland, pasture, and rangeland areas were adjusted to be compatible with 1980 estimates.

The procedures used to determine the number of growing-stock trees by species group and 2-inch diameter class have improved between the 1966 and 1980 forest inventories. The procedure used in 1966 over-estimated the number of growing-stock trees, especially in the lower diameter classes. We adjusted the 1966 estimates of number of trees so that differences between 1966 and 1980 represent actual changes in the resource, not changes in procedures.

The volume equations used in 1980 more accurately estimated tree volume than those used in 1966. Therefore, we adjusted the 1966 volumes by factors derived from the 1980 volume equations to make them comparable to 1980 volumes.

It should be noted that the 1980 inventory was 33 percent more intense thereby providing a more accurate information base than the 1966 inventory. Therefore, direct comparisons of the reports should be made with this in mind.

To ensure that it was possible to move from the adjusted 1966 volumes to the 1980 volumes, we then made a test by means of Timber Resource Analysis System (TRAS), a Forest Service computer program for updating, backdating, and projecting timber volume, growth, mortality, and removals. Using the 1966 numbers of softwood and hardwood trees by 2-inch diameter class and applying 1980 cubic feet per tree and board foot-cubic foot ratios yields estimates of 1966 softwood and hardwood volumes that are comparable with 1980 volumes. Then, using growth rates,

mortality rates, and removals rates for the period between the two surveys, TRAS moves the inventories through the period. The program prints out volumes by diameter class and softwoods and hardwoods for each year in the period. Thus, inconsistencies in volume, growth, mortality, and removals can be identified and resolved.

TRAS generates an estimate of what total removals had to be for the inventory to have changed as it did between surveys given the volume, growth and mortality inputs. Estimates for removals for products and for logging residues (two of the three components of total timber removals) are available from an independent utilization study. An estimate of "other" removals (see Definition of Terms in Appendix), the third component of total removals, is made by subtracting the first two removals components from the TRAS-generated total removals estimate. This estimate of "other" removals is compared with findings from remeasurement plots and new plots (stump counts and land use change) to check its validity. Total removals are "trend level removals" because the estimate of "other" removals is based on a removals trend line from 1966 to 1980.

In 1966 State Forest was a separate owner class and included only land on State Forests. Other forested State-owned land was included under the Other Public owner class. In 1980 the State owner class included all State land. However, State-owned land not within State Forest areas is small in the eastern Upper Peninsula and general comparisons may be made with the 1966 and 1980 State figures.

Some mining companies were called diversified forest industry in 1966 and classed under Forest Industry owner class. In 1980 these companies were included in the Miscellaneous Private Corporation owner class. Therefore, it is possible to compare statistics for Forest Industry owner between 1966 and 1980 by combining the Industry and Miscellaneous Private Corporation categories from the 1980 report.

LOG GRADE

In Michigan's Eastern Upper Peninsula the butt log of every sawtimber tree on every full permanent sample plot (2,973 trees) was graded for quality. Additionally, all of the logs in a smaller sample of trees throughout the State (2,239 trees) were graded. The volume yield by log grade for each tree in the latter sample was used to distribute the volume of trees in the former sample into log-grade classes. The resulting volumes by log-grade classes were expanded to provide an estimate for the entire Unit.

Logs were graded on the basis of external characteristics as indicators of quality. Hardwood species were graded according to "Hardwood Log Grades for Standard Lumber"[4]. The best 12-foot section of the lowest 16-foot hardwood log, or the best 12-foot upper section if the butt log did not meet minimum log-grade standards, was graded as follows:

[4]*Vaughn, C. L.; Wollin, A. C.; McDonald, K. A.; Bulgrin, E. H. Hardwood log grades for standard lumber. Res. Pap. FPL 63. Madison, WI: Department of Agriculture, Forest Service, Forest Products Laboratory; 1966. 52 p.*

Forest Service standard grades for hardwood factory saw logs

Grading factors		Specifications							
		Log grade 1			Log grade 2				Log grade 3
Position in tree		Butts only	Butts and uppers		Butts and uppers				Butts and uppers
Scaling diameter, inches		[1]13-15	16-19	20+	[2]11+		12+		8+
Length without trim, feet			10+		10+	8-9	10-11	12+	8+
Required clear cuttings[3] of each of three best faces[4]	Min. length, feet	7	5	3	3	3	3	3	2
	Max. number	2	2	2	2	2	2	3	No Limit
	Min. proportion of log length required in clear cutting	5/6	5/6	5/6	2/3	3/4	2/3	2/3	1/2
Maximum sweep and crook allowance	For logs with less than one-fourth of end in sound defects	15 percent			30 percent				50 percent
	For logs with more than one-fourth of end in sound defects	10 percent			20 percent				35 percent
Maximum scaling deduction		40 percent[5]			50 percent[6]				50 percent

[1]Ash and basswood butts can be 12 inches if they otherwise meet requirements for small #1's.
[2]Ten-inch logs of all species can be #2 if they otherwise meet requirements for small #1's.
[3]A clear cutting is a portion of a face, extending the width of the face, that is free of defects.
[4]A face is one-fourth of the surface of the log as divided lengthwise.
[5]Otherwise #1 logs with 41-60 percent deductions can be #2.
[6]Otherwise #2 logs with 51-60 percent deductions can be #3.

Forest Service standard specifications for hardwood construction logs (tie and timber logs)[1]

Position in tree		Butt and upper
Min. Diameter, Small end		8 inches +
Min. length, without trim		8 feet
Clear cuttings		No requirements.
Sweep allowance, absolute		One-fourth of the diameter at the small end for each 8 feet of length.
Sound surface defects	Single knots	Any number, if no one knot has an aver age diameter above the callus in excess of one-third of the log diameter at point of occurrence.
	Whorled knots	Any number if sum of knot diameters above the callus does not exceed one-third of the log diameter at point of occurrence.
	Holes	Any number provided none has a diameter over one-third of the log diameter at point of occurrence, and none extends more than 3 inches into included timber.[2]
Unsound surface defects		Same requirements as for sound defects if they extend into included timber.[2] No limit if they do not.
End defects	Sound	No requirements.
	Unsound	None allowed; log must be sound internally, but will admit one shake not to exceed one-fourth the scaling diameter and will admit a longitudinal split not extending more than 5 inches into the contained timber.

[1]These specifications are minimum for the class. If, from a group of logs, factory logs are selected first, thus leaving only nonfactory logs from which to select construction logs, then the quality range of the construction logs so selected is limited, and the class may be considered a grade. If selection for construction logs is given first priority, then it may be necessary to subdivide the class into grades.

[2]Included timber is always square, and dimension is judged from small end.

Softwood species were graded according to the following specifications on the next page.

Log Grades for Eastern White Pine

Log grade	Minimum size Diameter	Length[1]	Sweep or crook allowance	Total cull allowance including sweep	Maximum weevil injury	Allowable knot size (inches)[2] on three best faces or minimum clearness on four faces
	(Inches)	*(Feet)*	*(Percent)*		*(Number)*	*(Inches)*
1	12 & 13	8-16	20	50	0	Four faces clear full length
	14+	10-16	20	50	0	Two faces clear full length, or four faces clear 50 percent length (6 foot min. length)[3]
2	6+	8-16	30	50	0	Sound knots 1.e[4] D/6 and less than 3 inches.[5] Unsound knots: 1.e. 1½ inches and for: butt, lots 1.e. D/12, upper logs 1.e. D/10, or four faces clear 50 percent of length
3	6+	8-16	40	50	8-foot logs 1 weevil 10-foot logs: 2 weevils	Sound knots 1.e.D/3 and less than 5 inches Unsound knots 1.e. D/6 and less than 2½ inches.
4	6+	8-16	50	50	No limit	No limit

[1]Plus trim.
[2]Disregard all knots less than inch diameter in all grades.
[3]The sum of the diameter of sound knots plus twice the sum of the diameter of unsound knots (in inches) is less than or equal to of the diameter of the log (inches).
[4]1.e. means less than or equal to.
[5]D means d.i.b. of log at location of knot.

Log Grades for Jack Pine and Red Pine

Grade 1: logs with three or four clear faces.[5]

Grade 2: logs with one or two clear faces.

Grade 3: logs with no clear faces.

After the tentative log grade is established, the log will be degraded one grade for each of the following, except that no log can be degraded below grade 3. Net scale after deduction for defect must be at least 50 percent of the gross contents of the log.

1. *Sweep.* Degrade any tentative 1 or 2 log one grade if sweep amounts to 3 or more inches and equals or exceeds one third the diameter inside bark at small end.

2. *Heart rot.* Degrade any tentative 1 or 2 log grade if conk, massed hyphae, or other evidence of advance heart rot is found anywhere in it.

[5]*A face is one fourth of the circumference in width extending full length of the log. Clear faces are those free of: knots measuring more than ½-inch in diameter, overgrown knots of any size, holes more than ¼-inch in diameter. Faces may be rotated to obtain the maximum number of clear ones.*

Log Grades for All Other Softwood Logs

Grade 1

1. Logs must be 16 inches in diameter or larger, 10 feet or longer, and with deduction for defect not more than 30 percent of gross scale.
2. Logs must be at least 75 percent clear on each of three faces.
3. All knots outside clear cutting must be sound and not more than 2- inches in size.

Grade 2

1. Logs must be 12 inches in diameter or larger, 10 feet or longer, and with a net scale after deduction for defect of at least 50 percent of the gross contents of the log.
2. Logs must be at least 50 percent clear on each of three faces or 75 percent clear on two faces.

Grade 3

1. Logs must be 6 inches in diameter or larger, 8 feet or longer, and with a net scale after deduction for defect of at least 50 percent of the gross contents of the log.

Note: (A) Diameters are diameter inside bark (d.i.b.) at small end of log.
(B) Percent clear refers to percent clear in one continuous section.

TREE SPECIES GROUPS IN MICHIGAN'S EASTERN UPPER PENINSULA UNIT[6]

SOFTWOODS
- Eastern white pine ..... *Pinus strobus*
- Red pine ..... *Pinus resinosa*
- Jack pine ..... *Pinus banksiana*
- White spruce ..... *Picea glauca*
- Black spruce ..... *Picea mariana*
- Balsam fir ..... *Abies balsamea*
- Eastern hemlock ..... *Tsuga canadensis*
- Tamarack ..... *Larix laricina*
- Northern white-cedar ..... *Thuja occidentalis*

OTHER SOFTWOODS
- Eastern redcedar ..... *Juniperus virginiana*
- Norway spruce ..... *Picea abies*

HARDWOODS
- White oaks
  - Bur oak ..... *Quercus macrocarpa*
- Select red oak
  - Northern red oak ..... *Quercus rubra*
  - Yellow birch ..... *Betula alleghaniensis*
- Hard maples
  - Sugar maple ..... *Acer saccharum*
  - Black maple ..... *Acer nigrum*
- Soft maples
  - Red maple ..... *Acer rubrum*
  - Silver maple ..... *Acer saccharinum*
- American beech ..... *Fagus grandifolia*
- Ashes
  - White ash ..... *Fraxinus americana*
  - Black ash ..... *Fraxinus nigra*
  - Green ash ..... *Fraxinus pennsylvanica*
- Balsam poplar ..... *Populus balsamifera*
- Eastern cottonwood ..... *Populus deltoides*
- Aspens
  - Bigtooth aspen ..... *Populus grandidentata*
  - Quaking aspen ..... *Populus tremuloides*
- Basswood ..... *Tilia americana*
- Black cherry ..... *Prunus serotina*
- Elms
  - American elm ..... *Ulmus americana*
  - Slippery elm ..... *Ulmus rubra*
  - Rock elm ..... *Ulmus thomasii*
- Paper birch ..... *Betula papyrifera*

OTHER HARDWOODS
- Boxelder ..... *Acer negundo*
- River birch ..... *Betula nigra*
- Black willow ..... *Salix nigra*

[6]*The common and scientific names are based on: Little, Elbert L. Check list of native and naturalized trees of the United States. Agric. Handbk. 541. Washington, D.C.: U.S. Department of Agriculture, Forest Service, 1979. 375 p.*

METRIC EQUIVALENTS OF UNITS USED IN THIS REPORT

1 acre = 4,046.86 square meters or 0.405 hectare.
1,000 acres = 405 hectares.
1,000 board feet (International inch log rule) = 3.48 cubic meters.
Breast height = 1.4 meters above the ground.
1 cubic foot = 0.0283 cubic meter.
1 foot = 30.48 centimeters or 0.3048 meter.
1 inch = 25.4 millimeters, 2.54 centimeters, or 0.0254 meter.
1 pound = 0.454 kilogram.
1 ton = 0.907 metric ton.

DEFINITION OF TERMS

Acceptable trees.—Growing-stock trees of commercial species that meet specified standards of size and quality but do not qualify as desirable trees.

Area-condition classes.—Class 10.—Areas fully stocked with desirable trees but not overstocked.

Class 20.—Areas fully stocked with desirable trees but overstocked with all live trees.

Class 30.—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40.—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

Class 50.—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.

Class 60.—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.

Class 70.—Areas poorly stocked with desirable trees and poorly stocked with growing-stock trees.

Basal area.—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand are summed, the

result is usually expressed as square feet of basal area per acre.

Biomass.—The above-ground volume of all live trees (including bark and foliage) reported in green tons. Biomass is made up of 5 components:

Growing-stock bole.—Biomass of a growing-stock tree from a 1-foot stump to a variable 4-inch top.

Growing-stock tops and limbs.—Biomass of a growing-stock tree from a 1-foot stump minus the growing-stock bole.

Cull bole.—Biomass of a cull tree from a 1-foot stump to a variable 4-inch top.

Cull tops and limbs.—Biomass of a cull tree from a 1-inch stump minus the cull bole.

1- to 5-inch trees.—Biomass of all live trees 1- to 5-inches in diameter at breast height.

Commercial forest land.—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Note: Areas qualifying as commercial forest land have the capability of producing in excess of 20 cubic feet per acre per year of annual growth under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.) Also see definition of pastured commercial forest land.

Commercial species.—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam and hawthorn.)

County and municipal land.—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Cull.—Portions of a tree that are unusable for industrial wood products, because of rot, form, or other defect.

Desirable trees.—Growing-stock trees having no serious defects in quality limiting present or prospective use, and of relatively high vigor, and containing no pathogens that may result in death or serious deterioration before rotation age. These are trees that would be favored by forest managers in silvicultural operations.

Diameter classes.—A classification of trees based on diameter outside bark, measured at breast height (4- feet above the ground). (Note: d.b.h. is the common abbreviation for diameter at breast height. Two-inch diameter classes are commonly used in Forest Survey, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h. inclusive).

Farm.—Either a place operated as a unit of 10 or more acres from which the sale of agricultural products totals $50 or more annually, or a place operated as a unit of less than 10 acres from which the sale of agricultural products for a year amounts to at least $250. Places having less than the $50 or $250 minimum estimated sales in a given year are also counted as farms if they can normally be expected to produce goods in sufficient quantity to meet the requirements of the definition.

Farmer-owned land.—Land owned by farm operators. (Note: Excludes land leased by farm operators from nonfarm owners, such as railroad companies and States.)

Forest land.—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparison of basal area and/or number of trees, by age or size and spacing with specified standards.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide. Also see definitions for land area, commercial forest land, noncommercial forest land, productive-reserved forest land, stocking, unproductive forest land, and water.

Forest industry land.—Land owned by companies or individuals operating primary wood-using plants.

Forest trees.—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

Forest type.—A classification of forest land based upon the species forming a plurality of live tree stocking. Major forest types in Michigan are:

Jack pine.—Forests in which jack pine comprises a plurality of the stocking. (Common associates include eastern white pine, red pine, aspen, birch, and maple.)

Red pine.—Forests in which red pine comprises a plurality of the stocking. (Common associates include eastern white pine, jack pine, aspen, birch, and maple.)

White pine.—Forests in which eastern white pine comprises a plurality of the stocking. (Common associates include red pine, jack pine, aspen, birch, and maple.)

Balsam fir.—Forests in which balsam fir and white spruce comprise a plurality of stocking with balsam fir the most common. (Common associates include white spruce, aspen, maple, birch, northern white-cedar, and tamarack.)

White spruce.—Forests in which white spruce and balsam fir comprise a plurality of the stocking with white spruce the most common. (Common associates include balsam fir, aspen, maple, birch, northern white-cedar, and tamarack.)

Black spruce.—Forests in which swamp conifers comprise a plurality of the stocking with black spruce the most common. (Common associates include tamarack and northern white-cedar.)

Northern white-cedar.—Forests in which swamp conifers comprise a plurality of the stocking with northern white-cedar the most common. (Common associates include tamarack and black spruce.)

Tamarack.—Forests in which swamp conifers comprise a plurality of the stocking with tamarack the most common. (Common associates include black spruce and northern white-cedar.)

Oak-hickory.—Forests in which northern red oak, white oak, bur oak, or hickories, singly or in combination, comprise a plurality of the stocking. (Common associates include jack pine, beech, yellow-poplar, elm, and maple.)

Elm-ash-soft maple.—Forests in which lowland elm, ash, cottonwood, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include birches, spruce, and balsam fir.)

Maple-birch.—Forests in which sugar maple, basswood, yellow birch, upland American elm, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include white pine, elm, hemlock, and basswood.)

Aspen.—Forests in which quaking aspen or bigtooth aspen, singly or in combination, comprise a plurality of the stocking. (Common associates include balsam poplar, balsam fir, and paper birch.)

Paper birch.—Forests in which paper birch comprises a plurality of the stocking. (Common associates include maple, aspen, and balsam fir.)

Exotic.—Forests in which species not native to Michigan comprise a plurality of the stocking. (Mostly scotch pine plantations.)

Gross area.—The entire area of land and water as determined by the Bureau of the Census, 1970.

Growing-stock trees.—Live trees of commercial species qualifying as desirable and acceptable trees. (Note: Excludes rough, rotten, and dead trees.)

Growing-stock volume.—Net volume in cubic feet of growing-stock trees 5.0 inches d.b.h. and over, from a 1-foot stump to a minimum 4.0 inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs. Cubic feet can be converted to cords by multiplying by 79 cubic feet per solid wood cord.

Hardwoods.—Dicotyledonous trees, usually broad-leaved and deciduous.

Idle farmland.—Includes former croplands, orchards, improved pastures, and farm sites not tended within the past 2 years and presently less than 16.7 percent stocked with trees.

Improved pasture.—Land currently improved for grazing, by cultivation, seeding, irrigation, or clearing of trees or brush, and less than 16.7 percent stocked with live trees.

Indian land.—Tribal lands held in fee but administered by the Federal Government.

Land area.—A. *Bureau of the Census.* The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

B. *Forest Survey.* The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

Live trees.—Growing-stock, rough and rotten trees 1 inch d.b.h. and larger.

Log grades.—A classification of logs based on external characteristics as indicators of quality or value. (See Appendix for specific grading factors used.)

Logging residues.—The unused growing stock portions of trees cut or killed by logging.

Maintained road.—Any road, hard-topped or other surfaces, that is plowed or graded at least once a

year. Includes rights-of-way that are cut or treated to limit herbaceous growth.

Marsh.—Nonforest land that characteristically supportslow, generally herbaceous or shrubby vegetation and that is intermittently covered with water.

Merchantable.—Refers to a pulpwood or saw log section that meets pulpwood or saw log specifications, respectively.

Miscellaneous Federal land.—Federal land other than National Forest, and land administered by the Bureau of Land Management.

Miscellaneous private land.—Privately owned land other than forest-industry and farmer-owned land.

Mortality.—The volume of sound wood in growing-stock and sawtimber trees that die annually.

National Forest land.—Federal land that has been legally designated as National Forest or purchase units, and other land under the administration of the USDA Forest Service.

Net annual growth of growing-stock.— The annual change in volume of sound wood in livesawtimber and poletimber trees and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes.

Net annual growth of sawtimber.—The annual change in the volume of live sawtimber trees and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes.

Net volume.—Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

Noncommercial forest land.—(a) Unproductive forest land and (b) productive-reserved forest land.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Nonforest land.—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area, to qualify as nonforest land.)

a. *Nonforest land without trees.*—Nonforest land with no live trees present.

b. *Nonforest land with trees.*—Nonforest land with one or more trees per acre at least 5 inches d.b.h.

Nonstocked land.—Commercial forest land less than 16.7 percent stocked with growing-stock trees.

Other removals.—Growing-stock trees removed but not utilized for products, or trees left standing but "removed" from the commercial forest land classification by land use change. Examples are removals from cultural operations such as timber stand improvement work, land clearing, and changes in land use.

Ownership.—Property owned by one owner, regardless of the number of parcels in a specified area.

Ownership size class.—The amount of commercial forest land owned by one owner, regardless of the number or parcels.

Owner tenure.—The length of time a property has been held by the owner.

Physiographic class.—A measure of soil and water conditions that affect tree growth on a site. Physiographic classes used in Resources Evaluation inventories are:

Xeric sites.—Very dry soils where excessive drainage seriously limits both growth and species occurrence. Example: sandy jack pine plains.

Xeromesic sites.—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

Mesic sites.—Deep, well-drained soils. Growth and species occurrence are limited only by climate.

Hydromesic sites.—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: better drained bottomland hardwood sites.

Hydric sites.—Very wet sites where excess water seriously limits both growth and species occurrence. Example: wet, frequently flooded river bottoms and spruce bogs.

Plant byproducts.—Plant residues used for products such as mulch, pulp chips, and fuelwood.

Plant residues.—Wood and bark materials generated at manufacturing plants during production of other products.

Poletimber stands.—(See stand-size class.)

Poletimber trees.—Growing-stock trees of commercial species at least 5.0 inches d.b.h., but smaller than sawtimber size.

Productive-reserved forest land.—Forest land sufficiently productive to qualify as commercial forest land but withdrawn from timber utilization through statute, administrative regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in a tree is rotten.

Rough trees.—(a) Live trees of commercial species that do not contain at least one merchantable 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all live trees of noncommercial species.

Roundwood products.—Logs, bolts, or other round sections (including chips from roundwood) cut from trees for industrial or consumer uses. (Note: Includes saw logs; veneer logs and bolts; cooperage logs and bolts; pulpwood; fuelwood; piling; poles; posts; hewn ties; mine timbers; and various other round, split, or hewn products.)

Salvable dead trees.—Standing or down dead trees that are considered merchantable by Regional standards.

Saplings.—Live trees 1.0 to 5.0 inches d.b.h.

Sapling-seedling stands.—(See stand-size class.)

Saw log.—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight and with a minimum diameter outside bark (d.o.b.) for softwoods of 7 inches (9 inches for hardwoods) or other combinations of size and defect specified by Regional standards.

Saw log portion.—That part of the bole of sawtimber trees between the stump and the saw log top.

Saw log top.—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

Sawtimber stands.—(See stand-size class.)

Sawtimber trees.—Growing-stock trees of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting Regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h. Hardwoods must be at least 11.0 inches d.b.h.

Sawtimber volume.—Net volume of the saw log portion of live sawtimber in board feet, International inch rule, from stump to a minimum 7 inches top diameter outside bark (d.o.b.) for softwoods and a minimum 9 inches top d.o.b. for hardwoods.

Seedlings.—Live trees less than 1.0 inch d.b.h. that areexpected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

Short-log (rough tree).—Sawtimber-size trees of commercial species that contain at least one merchantable 8-to 11-foot saw log but not a 12-foot saw log.

Shrub biomass.—The total above-ground weight (including the bark) of selected shrubs and trees less than 1 inch d.b.h.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked natural stands.

Site index.—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

Softwoods.—Coniferous trees, usually evergreen, having needles or scale-like leaves.

Stand.—A growth of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

Stand-age class.—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

Stand-area class.—The extent of a continuous forested area of the same forest type, stand-size class, and stand-density class.

Stand-size class.—A classification of forest land based on the size class of growing-stock trees on the area; that is, sawtimber, poletimber or seedlings and saplings.

a. *Sawtimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

b. *Poletimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

c. *Sapling-seedling stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which more than half of the stocking is saplings and/or seedlings.

d. *Nonstocked stands.*—Stands in which stocking of growing-stock trees is less than 16.7 percent.

State land.—Land owned by States, or land leased to these governmental units for 50 years or more.

Stocking.—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5 inches d.b.h.

Stands are grouped into the following stocking classes:

Overstocked stands.—Stands in which stocking of trees is 134.0 percent or more.

Fully stocked stands.—Stands in which stocking of trees is from 101.0 to 133.9 percent.

Medium stocked stands.—Stands in which stocking of trees is from 61.0 to 100.9 percent.

Poorly stocked stands.—Stands in which stocking of trees is from 16.7 to 60.9 percent.

Nonstocked areas.—Commercial forest land on which stocking of trees is less than 16.7 percent.

Timber removals from growing stock.—The volume of sound wood in growing-stock trees removed annually for forest products (including roundwood products and logging residues) and for other removals.

Timber removals from saw timber.—The net board-foot volume of live sawtimbertrees removed for forest products annually (including roundwood products and logging residues) and for other removals.

Timber products output.—All timber products cut from roundwood and byproducts of wood manufacturing plants. Roundwood products include logs, bolts, or other round sections cut from growing-stock trees, cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edging, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulpwood chips or other products.

Tree biomass.—The total aboveground weight (including the bark) of all trees 1 to 5 inches in d.b.h., and the total aboveground weight (including the bark) from a 1-foot stump for trees more than 5 inches in diameter.

Tree size class.—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

Unproductive forest land.—Forest land incapable of producing 20 cubic feet per acre of annual growth or of yielding crops of industrial wood under natural conditions because of adverse site conditions. (Note: Adverse conditions include shallow soils, dry climate, poor drainage, high elevation, steepness, and rockiness.

Upper stem portion.—That part of the bole of sawtimber trees above the saw log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

Urban and other areas.—Areas within the legal boundaries of cities andtowns; suburban areas developed for residential, industrial, or recreational

purposes; schoolyards, cemeteries, roads; railroads; airports; beaches; powerlines; and other rights-of-way; or other nonforest land not included in any other specified land use class.

Water.—(a) *Bureau of the Census.*—Streams, sloughs, estuaries, and canals more than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds more than 40 acres in area.

(b) *Noncensus.*—The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

Wooded pasture.—Improved pasture with more than 16.7 percent stocking in live trees but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or there is other evidence of grazing.

Wooded strip.—An acre or more of natural continuous forest land that would otherwise meet survey standards for commercial forest land except that it is less than 120 feet wide.

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Table 1.--Area of land by land class, Eastern Upper Peninsula, Michigan, 1966[1/] and 1980

(In thousand acres)

Land class	1966[1/]	1980
FOREST LAND		
Commercial forest		
Jack pine	276.2	229.1
Red pine	173.8	139.8
White pine	22.7	68.7
Balsam fir-white spruce	393.1	247.5
Black spruce	224.9	283.1
Northern white-cedar	566.8	594.9
Tamarack	70.4	43.8
Oak-hickory	19.8	19.3
Elm-ash-soft maple	327.7	191.8
Maple-birch	1,199.1	1,160.2
Aspen	758.9	671.4
Paper birch	97.8	110.5
Exotic	--	1.2
Nonstocked	37.9	40.2
Subtotal	4,169.1	3,801.6
Noncommercial forest land		
Unproductive	79.5	102.4
Productive-reserved	32.7	127.6
Subtotal	112.2	230.0
Total	4,281.3	4,031.6
NONFOREST LAND		
Cropland	351.2	467.2
Pasture and range	3.6	4.3
Other	376.5	495.9
Total	731.3	967.4
TOTAL LAND	[2/]5,012.6	[3/]4,999.0
WATER (BUREAU OF THE CENSUS)	[2/]152.2	[3/]165.8
TOTAL LAND AND WATER	[2/]5,164.8	[3/]5,164.8

[1/]Figures have been adjusted from those published after the 1966 survey to conform to 1980 areas because of changes in survey procedures and definitions.

[2/]U.S. Department of Commerce, Bureau of Census. 1950.

[3/]U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20, No. 1.

Table 2.--Area of land by land use class and county,
Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Land use class	All counties	County						
		Alger	Chippewa	Delta	Luce	Mackinac	Menominee	Schoolcraft
FOREST LAND								
Commercial forest	3,801.6	491.9	705.9	574.5	468.4	524.3	493.4	543.2
Unproductive forest	102.4	5.0	23.8	21.9	17.0	19.7	1.9	13.1
Productive reserved	127.6	33.8	27.8	0.4	11.1	21.0	0.9	32.6
Total	4,031.6	530.7	757.5	596.8	496.5	565.0	496.2	588.9
NONFOREST LAND								
Nonforest with trees								
Cropland with trees	3.4	--	--	--	--	1.7	1.7	--
Improved pasture with trees	2.5	--	--	2.5	--	--	--	--
Wooded strips	24.9	1.7	7.0	8.7	--	--	3.5	4.0
Idle farmland with trees	1.8	--	1.8	--	--	--	--	--
Marsh with trees	49.0	--	5.5	1.7	11.7	8.6	6.3	15.2
Urban and other windbreaks	--	--	--	--	--	--	--	--
Windbreaks	1.7	--	--	--	--	1.7	--	--
Wooded pasture	--	--	--	--	--	--	--	--
Subtotal	83.3	1.7	14.3	12.9	11.7	12.0	11.5	19.2
Nonforest without trees								
Cropland without trees	446.4	18.4	160.5	96.2	5.3	27.2	119.9	18.9
Improved pasture without trees	1.8	--	--	--	1.8	--	--	--
Idle farm without trees	2.0	2.0	--	--	--	--	--	--
Marsh without trees	240.3	7.1	29.4	8.0	53.0	16.2	8.0	118.6
Other farm-farmstead	17.4	1.8	1.7	5.2	1.8	--	6.9	--
Urban and other	162.5	15.6	51.7	28.9	10.0	27.0	21.8	7.5
Noncensus water	13.7	1.6	2.5	5.0	--	1.7	--	2.9
Subtotal	884.1	46.5	245.8	143.3	71.9	72.1	156.6	147.9
Total	967.4	48.2	260.1	156.2	83.6	84.1	168.1	167.1
TOTAL LAND	4,999.0	578.9	1,017.6	753.0	580.1	649.1	664.3	756.0
WATER (BUREAU OF THE CENSUS)	[1]/165.8	18.9	39.0	16.3	14.5	42.7	3.9	30.5
TOTAL LAND AND WATER	[1]/5,164.8	597.8	1,056.6	769.3	594.6	691.8	668.2	786.5

[1]/U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20, No. 1.

Table 3.--Area of commercial forest land by ownership class and county, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Ownership class	All counties	County						
		Alger	Chippewa	Delta	Luce	Mackinac	Menominee	Schoolcraft
National Forest	741.4	106.1	197.5	210.5	--	123.3	--	104.0
Bureau of Land Mgmt.	--	--	--	--	--	--	--	--
Miscellaneous federal	20.6	--	3.1	--	--	--	--	17.5
Indian	6.0	--	--	--	--	--	6.0	--
State	976.6	90.8	168.8	63.4	209.4	167.3	79.3	197.6
County and municipal	8.9	1.4	--	1.5	--	--	1.4	4.6
Forest industry	635.5	172.6	69.6	80.9	123.1	29.8	74.4	85.1
Farmer	478.2	79.7	77.7	118.5	7.8	44.3	125.3	24.9
Misc. private-corp.	227.9	9.2	41.4	7.6	12.7	82.8	62.0	12.2
Misc. private-indiv.	706.5	32.1	147.8	92.1	115.4	76.8	145.0	97.3
All owners	3,801.6	491.9	705.9	574.5	468.4	524.3	493.4	543.2

Table 4.--Area of commercial forest land by forest type, physiographic class, and ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Forest type and physiographic class	All owners	Ownership class									
		National Forest	Bureau of Land Mgmt.	Misc. federal	Indian	State	County & municipal	Forest industry	Farmer	Misc. priv.-corp.	Misc. priv.-indiv.
Jack pine											
Hydric	0.7	0.7	--	--	--	--	--	--	--	--	--
Hydromesic	47.9	24.4	--	4.2	--	17.7	--	--	--	--	1.6
Mesic	16.1	--	--	--	--	14.6	--	--	--	--	1.5
Xeromesic	144.8	58.2	--	2.9	--	66.2	--	4.3	2.9	2.9	7.4
Xeric	19.6	11.8	--	--	--	7.8	--	--	--	--	--
All classes	229.1	95.1	--	7.1	--	106.3	--	4.3	2.9	2.9	10.5
Red pine											
Hydric	1.7	--	--	--	--	1.7	--	--	--	--	--
Hydromesic	--	--	--	--	--	--	--	--	--	--	--
Mesic	37.0	10.5	--	1.9	--	16.3	--	--	3.7	1.5	3.1
Xeromesic	101.1	80.3	--	--	--	16.2	1.4	1.4	--	--	1.8
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	139.8	90.8	--	1.9	--	34.2	1.4	1.4	3.7	1.5	4.9
White pine											
Hydric	1.5	--	--	--	--	1.5	--	--	--	--	--
Hydromesic	18.1	4.1	--	--	--	4.5	--	4.7	3.3	--	1.5
Mesic	39.8	7.4	--	--	--	19.5	--	3.2	3.0	3.7	3.0
Xeromesic	9.3	--	--	--	--	4.6	--	--	--	1.7	3.0
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	68.7	11.5	--	--	--	30.1	--	7.9	6.3	5.4	7.5
Balsam fir											
Hydric	7.9	--	--	--	--	1.5	--	--	2.9	--	3.5
Hydromesic	138.7	27.1	--	--	--	28.7	--	24.7	15.2	6.6	36.4
Mesic	57.4	--	--	1.5	--	18.2	--	7.5	10.8	8.2	11.2
Xeromesic	13.4	13.4	--	--	--	--	--	--	--	--	--
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	217.4	40.5	--	1.5	--	48.4	--	32.2	28.9	14.8	51.1
White spruce											
Hydric	--	--	--	--	--	--	--	--	--	--	--
Hydromesic	11.9	--	--	--	--	3.1	--	--	1.4	4.5	2.9
Mesic	18.2	--	--	--	--	7.8	--	2.8	--	3.0	4.6
Xeromesic	--	--	--	--	--	--	--	--	--	--	--
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	30.1	--	--	--	--	10.9	--	2.8	1.4	7.5	7.5

(Table 4 continued on next page)

(Table 4 continued)

Forest type and physiographic class	All owners	Ownership class									
		National Forest	Bureau of Land Mgmt.	Misc. federal	Indian	State	County & municipal	Forest industry	Farmer	Misc. priv.-corp.	Misc. priv.-indiv.
Black spruce											
Hydric	62.3	23.4	--	--	--	20.3	--	4.6	2.7	6.5	4.8
Hydromesic	160.1	41.6	--	--	--	58.5	--	22.9	7.6	8.2	21.3
Mesic	16.2	--	--	--	--	7.6	--	--	1.5	--	7.1
Xeromesic	44.5	44.5	--	--	--	--	--	--	--	--	--
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	283.1	109.5	--	--	--	86.4	--	27.5	11.8	14.7	33.2
Northern white-cedar											
Hydric	80.6	9.7	--	--	--	29.6	--	16.1	9.4	4.6	11.2
Hydromesic	477.7	37.4	--	--	1.6	133.1	3.1	101.2	70.5	37.0	93.8
Mesic	36.6	--	--	--	--	9.3	--	6.2	8.8	3.1	9.2
Xeromesic	--	--	--	--	--	--	--	--	--	--	--
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	594.9	47.1	--	--	1.6	172.0	3.1	123.4	88.8	44.7	114.2
Tamarack											
Hydric	11.2	--	--	--	--	4.6	--	5.0	--	--	1.6
Hydromesic	32.6	--	--	--	--	17.1	--	4.9	5.8	--	4.8
Mesic	--	--	--	--	--	--	--	--	--	--	--
Xeromesic	--	--	--	--	--	--	--	--	--	--	--
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	43.8	--	--	--	--	21.7	--	9.9	5.8	--	6.4
Oak-hickory											
Hydric	--	--	--	--	--	--	--	--	--	--	--
Hydromesic	--	--	--	--	--	--	--	--	--	--	--
Mesic	17.4	0.4	--	--	--	6.3	--	--	--	3.1	7.6
Xeromesic	1.9	0.4	--	--	--	--	--	--	--	--	1.5
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	19.3	0.8	--	--	--	6.3	--	--	--	3.1	9.1
Elm-ash-soft maple											
Hydric	8.9	--	--	--	--	3.3	--	1.6	1.0	--	3.0
Hydromesic	182.9	6.3	--	--	1.5	43.3	1.5	36.1	40.5	9.3	44.4
Mesic	--	--	--	--	--	--	--	--	--	--	--
Xeromesic	--	--	--	--	--	--	--	--	--	--	--
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	191.8	6.3	--	--	1.5	46.6	1.5	37.7	41.5	9.3	47.4

(Table 4 continued on next page)

(Table 4 continued)

Forest type and physiographic class	All owners	Ownership class									
		National Forest	Bureau of Land Mgmt.	Misc. federal	Indian	State	County & municipal	Forest industry	Farmer	Misc. priv.-corp.	Misc. priv.-indiv.
Maple-birch											
Hydric	1.4	--	--	--	--	--	--	1.4	--	--	--
Hydromesic	87.2	15.0	--	--	--	11.1	--	31.5	12.0	1.5	16.1
Mesic	1,046.7	158.9	--	1.6	2.9	192.1	2.9	273.6	130.2	63.1	221.4
Xeromesic	25.0	15.7	--	--	--	7.8	--	--	1.5	--	--
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	1,160.3	189.6	--	1.6	2.9	211.0	2.9	306.5	143.7	64.6	237.5
Aspen											
Hydric	27.7	26.2	--	--	--	--	--	--	--	--	1.5
Hydromesic	302.4	61.2	--	1.5	--	42.0	--	41.1	66.5	15.7	74.4
Mesic	278.9	2.6	--	3.9	--	87.0	--	29.6	58.6	18.9	78.3
Xeromesic	62.4	31.9	--	--	--	21.1	--	--	--	6.3	3.1
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	671.4	121.9	--	5.4	--	150.1	--	70.7	125.1	40.9	157.3
Paper birch											
Hydric	4.5	--	--	--	--	--	--	1.5	3.0	--	--
Hydromesic	51.2	16.9	--	--	--	12.1	--	6.5	4.6	3.1	8.0
Mesic	48.2	--	--	1.5	--	21.8	--	3.1	7.8	9.4	4.6
Xeromesic	6.6	6.6	--	--	--	--	--	--	--	--	--
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	110.5	23.5	--	1.5	--	33.9	--	11.1	15.4	12.5	12.6
Exotic											
Hydric	--	--	--	--	--	--	--	--	--	--	--
Hydromesic	--	--	--	--	--	--	--	--	--	--	--
Mesic	1.2	--	--	--	--	--	--	--	1.2	--	--
Xeromesic	--	--	--	--	--	--	--	--	--	--	--
Xeric	--	--	--	--	--	--	--	--	--	--	--
All classes	1.2	--	--	--	--	--	--	--	1.2	--	--
Nonstocked											
Hydric	8.0	1.7	--	--	--	4.8	--	--	--	--	1.5
Hydromesic	7.1	1.2	--	--	--	1.6	--	--	1.8	--	2.5
Mesic	14.5	1.7	--	1.6	--	6.3	--	--	--	1.6	3.3
Xeromesic	9.1	0.2	--	--	--	4.5	--	--	--	4.4	--
Xeric	1.5	--	--	--	--	1.5	--	--	--	--	--
All classes	40.2	4.8	--	1.6	--	18.7	--	--	1.8	6.0	7.3
All types											
Hydric	216.4	61.7	--	--	--	67.3	--	30.2	19.0	11.1	27.1
Hydromesic	1,517.8	235.2	--	5.7	3.1	372.8	4.6	273.6	229.2	85.9	307.7
Mesic	1,628.2	181.5	--	12.0	2.9	406.8	2.9	326.0	225.6	115.6	354.9
Xeromesic	418.1	251.2	--	2.9	--	120.4	1.4	5.7	4.4	15.3	16.8
Xeric	21.1	11.8	--	--	--	9.3	--	--	--	--	--
All classes	3,801.6	741.4	--	20.6	6.0	976.6	8.9	635.5	478.2	227.9	706.5

Table 5.--Area of commercial forest land by ownership class and site class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Ownership class	All classes	Site class (cubic feet of growth per acre per year) 225+	165-224	120-164	85-119	50-84	20-49
National Forest	741.4	--	--	23.5	85.4	241.3	391.2
Bureau of Land Mgmt.	--	--	--	--	--	--	--
Miscellaneous federal	20.6	--	--	1.5	--	9.2	9.9
Indian	6.0	--	--	--	--	1.4	4.6
State	976.6	--	--	10.6	75.8	311.0	579.2
County and municipal	8.9	--	--	--	2.8	1.5	4.6
Forest industry	635.5	--	--	4.8	60.0	212.8	357.9
Farmer	478.2	--	--	7.8	80.9	163.3	226.2
Misc. private-corp.	227.9	--	--	6.0	19.5	75.0	127.4
Misc. private-indiv.	706.5	--	--	15.7	94.8	273.9	322.1
All owners	3,801.6	--	--	69.9	419.2	1,289.4	2,023.1

Table 6.--Area of commercial forest land by ownership class and stand-volume class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Ownership class	All classes	Stand-volume class (board feet[1/]) Less than 1,500	1,500 to 5,000	5,000+
National Forest	741.4	378.7	219.2	143.5
Bureau of Land Mgmt.	--	--	--	--
Miscellaneous federal	20.6	11.2	9.4	--
Indian	6.0	1.6	4.4	--
State	976.6	493.1	373.3	110.2
County and municipal	8.9	6.0	2.9	--
Forest industry	635.5	222.3	256.3	156.9
Farmer	478.2	246.8	182.5	48.9
Misc. private-corp.	227.9	103.8	89.9	34.2
Misc. private-indiv.	706.5	318.6	296.9	91.0
All owners	3,801.6	1,782.1	1,434.8	584.7

[1/] International 1/4-inch rule.

Table 7.--Area of privately owned commercial forest land by ownership class, owner tenure, and size of owner, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Ownership class and owner tenure class	Total	Size of owner (acres)								
		1-4	5-10	11-20	21-50	51-100	101-500	501-2,500	2,501-5,000	5001+
Forest Industry										
1-4 years	136.7	--	--	--	--	--	--	--	--	136.7
5-9 years	41.7	--	--	--	--	--	--	--	--	41.7
10-19 years	48.6	--	--	--	--	--	--	1.5	--	47.1
20+ years	408.5	--	--	--	--	--	--	1.6	--	406.9
All classes	635.5	--	--	--	--	--	--	3.1	--	632.4
Farmer										
1-4 years	67.2	--	1.5	2.8	10.5	15.3	33.0	1.5	1.0	1.6
5-9 years	82.4	--	--	--	13.1	31.5	28.4	8.0	--	1.4
10-19 years	121.5	1.5	--	1.5	17.7	27.7	64.3	7.3	1.5	--
20+ years	207.1	--	1.5	1.0	21.1	42.7	109.6	22.8	--	8.4
All classes	478.2	1.5	3.0	5.3	62.4	117.2	235.3	39.6	2.5	11.4
Misc. priv.-corporation										
1-4 years	37.3	--	--	--	1.5	3.2	6.6	10.5	1.5	14.0
5-9 years	39.7	--	--	--	--	1.4	7.6	19.5	6.3	4.9
10-19 years	21.5	--	--	--	--	--	7.8	4.5	1.6	7.6
20+ years	129.4	--	--	--	1.5	3.1	7.9	21.2	1.5	94.2
All classes	227.9	--	--	--	3.0	7.7	29.9	55.7	10.9	120.7
Misc. priv.-individual										
1-4 years	188.6	3.9	4.5	15.9	52.8	28.7	52.5	21.0	1.4	7.9
5-9 years	185.0	--	3.2	4.7	63.0	27.0	67.9	16.0	--	3.2
10-19 years	159.5	--	1.4	--	36.6	31.2	66.7	19.1	4.5	--
20+ years	173.4	1.5	--	2.9	57.7	34.6	53.2	22.0	--	1.5
All classes	706.5	5.4	9.1	23.5	210.1	121.5	240.3	78.1	5.9	12.6
All private owners										
1-4 years	429.8	3.9	6.0	18.7	64.8	47.2	92.1	33.0	3.9	160.2
5-9 years	348.8	--	3.2	4.7	76.1	59.9	103.9	43.5	6.3	51.2
10-19 years	351.1	1.5	1.4	1.5	54.3	58.9	138.8	32.4	7.6	54.7
20+ years	918.4	1.5	1.5	3.9	80.3	80.4	170.7	67.6	1.5	511.0
All classes	2,048.1	6.9	12.1	28.8	275.5	246.4	505.5	176.5	19.3	777.1

Table 8.--Area of commercial forest land by forest type, stand-size class, and ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Forest type and stand-size class	All owners	Ownership class									
		National Forest	Bureau of Land Mgmt.	Misc. federal	Indian	State	County & municipal	Forest industry	Farmer	Misc. priv.-corp.	Misc. priv.-indiv.
Jack pine											
Sawtimber	38.1	1.7	--	2.9	--	24.8	--	1.5	2.9	1.4	2.9
Poletimber	162.1	93.4	--	4.2	--	55.7	--	2.8	--	1.5	4.5
Sapling & seedling	28.9	--	--	--	--	25.8	--	--	--	--	3.1
All stands	229.1	95.1	--	7.1	--	106.3	--	4.3	2.9	2.9	10.5
Red pine											
Sawtimber	38.4	14.8	--	1.9	--	20.0	--	--	--	--	1.7
Poletimber	59.8	46.2	--	--	--	5.2	1.4	1.4	3.8	--	1.8
Sapling & seedling	41.6	29.8	--	--	--	8.9	--	--	--	1.5	1.4
All stands	139.8	90.8	--	1.9	--	34.1	1.4	1.4	3.8	1.5	4.9
White pine											
Sawtimber	43.3	8.1	--	--	--	14.3	--	7.8	4.7	5.4	3.0
Poletimber	15.3	3.3	--	--	--	7.5	--	--	--	--	4.5
Sapling & seedling	10.1	--	--	--	--	8.4	--	--	1.7	--	--
All stands	68.7	11.4	--	--	--	30.2	--	7.8	6.4	5.4	7.5
Balsam fir											
Sawtimber	48.7	27.1	--	1.5	--	4.8	--	4.5	3.1	--	7.7
Poletimber	102.6	13.4	--	--	--	23.1	--	14.5	18.1	9.3	24.2
Sapling & seedling	66.1	--	--	--	--	20.6	--	13.2	7.7	5.4	19.2
All stands	217.4	40.5	--	1.5	--	48.5	--	32.2	28.9	14.7	51.1
White spruce											
Sawtimber	10.4	--	--	--	--	3.1	--	--	1.4	3.0	2.9
Poletimber	10.5	--	--	--	--	3.0	--	--	--	3.0	4.5
Sapling & seedling	9.2	--	--	--	--	4.9	--	2.8	--	1.5	--
All stands	30.1	--	--	--	--	11.0	--	2.8	1.4	7.5	7.4
Black spruce											
Sawtimber	6.5	--	--	--	--	3.4	--	1.5	--	--	1.6
Poletimber	149.7	84.5	--	--	--	31.2	--	11.0	4.5	5.0	13.5
Sapling & seedling	126.9	25.1	--	--	--	52.0	--	14.8	7.3	9.7	18.0
All stands	283.1	109.6	--	--	--	86.6	--	27.3	11.8	14.7	33.1
Northern white-cedar											
Sawtimber	131.9	5.2	--	--	--	48.9	--	35.0	7.5	12.6	22.7
Poletimber	305.9	36.7	--	--	--	85.6	1.6	63.2	46.4	20.1	52.3
Sapling & seedling	157.1	5.3	--	--	1.6	37.5	1.5	25.2	34.7	12.1	39.2
All stands	594.9	47.2	--	--	1.6	172.0	3.1	123.4	88.6	44.8	114.2

(Table 8 continued on next page)

(Table 8 continued)

Forest type and stand-size class	All owners	Ownership class									
		National Forest	Bureau of Land Mgmt.	Misc. Federal	Indian	State	County & municipal	Forest industry	Farmer	Misc. priv.-corp.	Misc. priv.-indiv.
Tamarack											
Sawtimber	1.4	--	--	--	--	1.4	--	--	--	--	--
Poletimber	19.6	--	--	--	--	11.3	--	3.6	1.5	--	3.2
Sapling & seedling	22.8	--	--	--	--	9.0	--	6.4	4.3	--	3.1
All stands	43.8	--	--	--	--	21.7	--	10.0	5.8	--	6.3
Oak-hickory											
Sawtimber	6.3	--	--	--	--	1.6	--	--	--	1.5	3.2
Poletimber	11.4	0.8	--	--	--	3.1	--	--	--	1.5	6.0
Sapling & seedling	1.6	--	--	--	--	1.6	--	--	--	--	--
All stands	19.3	0.8	--	--	--	6.3	--	--	--	3.0	9.2
Elm-ash-soft maple											
Sawtimber	58.8	2.7	--	--	1.5	16.7	--	7.8	6.2	3.2	20.7
Poletimber	70.7	3.6	--	--	--	17.9	--	12.3	22.0	3.0	11.9
Sapling & seedling	62.3	--	--	--	--	12.0	1.5	17.7	13.3	3.1	14.7
All stands	191.8	6.3	--	--	1.5	46.6	1.5	37.8	41.5	9.3	47.3
Maple-birch											
Sawtimber	519.0	63.0	--	--	--	89.4	--	198.8	47.6	23.4	96.9
Poletimber	483.7	126.5	--	1.6	2.9	78.9	1.4	68.0	71.9	24.2	108.3
Sapling & seedling	157.6	--	--	--	--	42.5	1.5	39.9	24.0	17.0	32.7
All stands	1,160.3	189.5	--	1.6	2.9	210.8	2.9	306.7	143.5	64.6	237.8
Aspen											
Sawtimber	93.6	16.0	--	--	--	14.0	--	1.5	30.3	10.7	21.1
Poletimber	353.6	80.6	--	3.9	--	72.9	--	29.0	56.9	17.5	92.8
Sapling & seedling	224.2	25.4	--	1.5	--	63.1	--	40.2	38.0	12.7	43.3
All stands	671.4	122.0	--	5.4	--	150.0	--	70.7	125.2	40.9	157.2
Paper birch											
Sawtimber	9.6	1.9	--	--	--	3.1	--	--	--	--	4.6
Poletimber	79.0	21.5	--	1.5	--	26.5	--	6.1	9.3	11.0	3.1
Sapling & seedling	21.9	--	--	--	--	4.3	--	5.0	6.1	1.5	5.0
All stands	110.5	23.4	--	1.5	--	33.9	--	11.1	15.4	12.5	12.7
Exotic											
Sawtimber	--	--	--	--	--	--	--	--	--	--	--
Poletimber	1.2	--	--	--	--	--	--	--	1.2	--	--
Sapling & seedling	--	--	--	--	--	--	--	--	--	--	--
All stands	1.2	--	--	--	--	--	--	--	1.2	--	--
Nonstocked	40.2	4.8	--	1.6	--	18.6	--	--	1.8	6.1	7.3
All types											
Sawtimber	1,006.0	140.5	--	6.3	1.5	245.5	--	258.4	103.7	61.2	188.9
Poletimber	1,825.1	510.5	--	11.2	2.9	421.9	4.4	211.9	235.6	96.1	330.6
Sapling & seedling	930.3	85.6	--	1.5	1.6	290.6	4.5	165.2	137.1	64.5	179.7
Nonstocked	40.2	4.8	--	1.6	--	18.6	--	--	1.8	6.1	7.3
All stands	3,801.6	741.4	--	20.6	6.0	976.6	8.9	635.5	478.2	227.9	706.5

Table 9.--Area of commercial forest land by forest type and county, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Forest type	All counties	County						
		Alger	Chippewa	Delta	Luce	Mackinac	Menominee	Schoolcraft
Jack pine	229.1	10.4	87.9	24.8	44.1	9.5	3.2	49.2
Red pine	139.8	21.9	32.4	26.2	14.9	15.7	1.4	27.3
White pine	68.7	11.0	7.2	2.6	15.1	4.6	10.0	18.2
Balsam fir	217.4	14.4	40.8	55.6	15.5	43.2	17.5	30.4
White spruce	30.1	3.0	5.8	1.6	5.8	9.2	1.5	3.2
Black spruce	283.1	16.6	69.9	46.1	29.4	48.8	21.9	50.4
Northern white-cedar	594.9	43.4	76.7	117.1	69.6	82.4	128.0	77.7
Tamarack	43.8	--	3.1	4.3	9.7	4.7	15.8	6.2
Oak-hickory	19.3	0.1	5.1	1.9	1.5	0.1	10.6	--
Elm-ash-soft maple	191.8	25.8	35.4	32.3	21.3	5.1	53.2	18.7
Maple-birch	1,160.3	313.0	163.5	104.4	191.0	135.4	112.1	140.9
Aspen	671.4	21.1	155.7	129.6	44.6	137.7	100.5	82.2
Paper birch	110.5	3.5	18.8	27.3	--	20.1	15.2	25.6
Exotic	1.2	--	1.2	--	--	--	--	--
Nonstocked	40.2	7.7	2.4	0.7	5.9	7.7	2.5	13.3
All types	3,801.6	491.9	705.9	574.5	468.4	524.2	493.4	543.3

Table 10.--Area of commercial forest land by county and stand-size class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

County	All stands	Stand-size class			
		Sawtimber stands	Poletimber stands	Sapling and seedling stands	Nonstocked areas
Alger	491.9	212.6	194.5	77.1	7.7
Chippewa	705.9	173.5	378.6	151.4	2.4
Delta	574.5	99.2	329.4	145.2	0.7
Luce	468.4	179.8	163.3	119.4	5.9
Mackinac	524.2	122.1	283.2	111.3	7.6
Menominee	493.4	79.2	230.6	181.1	2.5
Schoolcraft	543.3	139.6	245.5	144.8	13.4
All counties	3,801.6	1,006.0	1,825.1	930.3	40.2

Table 11.--Area of commercial forest land by forest type, stand-size class, and site class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Forest type and stand-size class	All classes	Site class (cubic feet of growth per acre per year)					
		225+	165-224	120-164	85-119	50-84	20-49
Jack pine							
Sawtimber	38.1	--	--	--	1.4	7.4	29.3
Poletimber	162.1	--	--	--	1.6	22.7	137.8
Sapling & seedling	28.9	--	--	--	--	3.3	25.6
All stands	229.1	--	--	--	3.0	33.4	192.7
Red pine							
Sawtimber	38.4	--	--	--	13.4	19.2	5.8
Poletimber	59.8	--	--	--	16.5	39.1	4.2
Sapling & seedling	41.6	--	--	--	17.8	23.8	--
All stands	139.8	--	--	--	47.7	82.1	10.0
White pine							
Sawtimber	43.3	--	--	3.2	3.0	20.5	16.6
Poletimber	15.3	--	--	--	1.5	5.9	7.9
Sapling & seedling	10.1	--	--	--	1.9	1.8	6.4
All stands	68.7	--	--	3.2	6.4	28.2	30.9
Balsam fir							
Sawtimber	48.7	--	--	6.2	8.9	30.3	3.3
Poletimber	102.6	--	--	18.1	65.3	15.0	4.2
Sapling & seedling	66.1	--	--	9.2	27.6	17.3	12.0
All stands	217.4	--	--	33.5	101.8	62.6	19.5
White spruce							
Sawtimber	10.4	--	--	--	4.6	4.3	1.5
Poletimber	10.5	--	--	--	1.5	4.5	4.5
Sapling & seedling	9.2	--	--	--	1.6	7.6	--
All stands	30.1	--	--	--	7.7	16.4	6.0
Black spruce							
Sawtimber	6.5	--	--	--	--	--	6.5
Poletimber	149.7	--	--	--	4.4	12.2	133.1
Sapling & seedling	126.9	--	--	--	1.5	9.3	116.1
All stands	283.1	--	--	--	5.9	21.5	255.7
Northern white-cedar							
Sawtimber	131.9	--	--	--	--	15.7	116.2
Poletimber	305.9	--	--	--	4.6	19.5	281.8
Sapling & seedling	157.1	--	--	--	--	6.3	150.8
All stands	594.9	--	--	--	4.6	41.5	548.8

(Table 11 continued on next page)

(Table 11 continued)

Forest type and stand-size class	All classes	Site class (cubic feet of growth per acre per year)					
		225+	165-224	120-164	85-119	50-84	20-49
Tamarack							
Sawtimber	1.4	--	--	--	--	--	1.4
Poletimber	19.6	--	--	--	--	3.3	16.3
Sapling & seedling	22.8	--	--	--	--	3.2	19.6
All stands	43.8	--	--	--	--	6.5	37.3
Oak-hickory							
Sawtimber	6.3	--	--	--	--	6.3	--
Poletimber	11.4	--	--	--	--	7.9	3.5
Sapling & seedling	1.6	--	--	--	--	1.6	--
All stands	19.3	--	--	--	--	15.8	3.5
Elm-ash-soft maple							
Sawtimber	58.8	--	--	--	1.5	6.2	51.1
Poletimber	70.7	--	--	--	--	11.5	59.2
Sapling & seedling	62.3	--	--	--	1.5	8.0	52.8
All stands	191.8	--	--	--	3.0	25.7	163.1
Maple-birch							
Sawtimber	519.0	--	--	--	42.6	246.7	229.7
Poletimber	483.7	--	--	3.3	29.2	266.3	184.9
Sapling & seedling	157.6	--	--	--	6.7	65.0	85.9
All stands	1,160.3	--	--	3.3	78.5	578.0	500.5
Aspen							
Sawtimber	93.6	--	--	--	21.9	50.0	21.7
Poletimber	353.6	--	--	1.7	98.5	175.0	78.4
Sapling & seedling	224.2	--	--	3.3	34.2	113.0	73.7
All stands	671.4	--	--	5.0	154.6	338.0	173.8
Paper birch							
Sawtimber	9.6	--	--	2.0	--	3.1	4.5
Poletimber	79.0	--	--	21.5	--	29.5	28.0
Sapling & seedling	21.9	--	--	--	1.5	--	20.4
All stands	110.5	--	--	23.5	1.5	32.6	52.9
Exotic							
Sawtimber	--	--	--	--	--	--	--
Poletimber	1.2	--	--	--	1.2	--	--
Sapling & seedling	--	--	--	--	--	--	--
All stands	1.2	--	--	--	1.2	--	--
Nonstocked	40.2	--	--	1.4	3.3	7.1	28.4
All types							
Sawtimber	1,006.0	--	--	11.4	97.3	409.7	487.6
Poletimber	1,825.1	--	--	44.6	224.3	612.4	943.8
Sapling & seedling	930.3	--	--	12.5	94.3	260.2	563.3
Nonstocked	40.2	--	--	1.4	3.3	7.1	28.4
All stands	3,801.6	--	--	69.9	419.2	1,289.4	2,023.1

Table 12.--Area of commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Forest type	All ages	Stand-age class (years)												
		1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-140	141+
Jack pine	229.1	30.0	11.4	15.2	48.0	75.9	24.4	13.9	7.2	3.1	--	--	--	--
Red pine	139.8	16.4	29.5	23.0	34.5	11.4	4.9	6.0	7.6	1.5	1.6	3.4	--	--
White pine	68.7	5.1	3.3	3.2	3.3	4.4	8.7	11.0	9.0	2.2	3.6	7.3	4.5	3.1
Balsam fir	217.4	22.7	28.4	13.4	34.9	57.4	30.2	12.2	6.0	1.4	1.5	6.3	3.0	--
White spruce	30.1	1.5	6.5	1.2	--	8.9	3.1	1.6	2.8	3.0	--	1.5	--	--
Black spruce	283.1	31.0	32.5	90.9	54.2	23.2	20.7	14.6	4.7	3.2	4.7	1.6	--	1.8
Northern white-cedar	594.9	13.6	37.3	59.0	55.8	37.4	50.9	63.8	53.3	58.4	42.4	62.6	35.2	25.2
Tamarack	43.8	2.9	5.9	6.1	4.7	1.5	8.3	6.6	3.3	1.5	1.6	1.4	--	--
Oak-hickory	19.3	--	1.7	--	0.3	3.5	6.0	3.2	--	1.5	1.5	--	1.6	--
Elm-ash-soft maple	191.8	24.5	18.7	16.0	10.0	20.9	26.3	12.0	14.0	9.9	13.2	16.3	7.0	3.0
Maple-birch	1,160.3	71.0	59.4	44.2	73.0	178.1	144.4	107.1	74.2	87.9	102.4	125.3	67.4	25.9
Aspen	671.4	142.3	71.9	28.4	109.0	123.3	92.0	51.6	12.3	12.0	20.1	8.5	--	--
Paper birch	110.5	16.0	7.8	3.2	4.8	16.2	23.4	25.4	7.6	--	3.1	3.0	--	--
Exotic	1.2	--	--	1.2	--	--	--	--	--	--	--	--	--	--
Nonstocked	40.2	25.8	3.0	--	5.2	1.5	3.3	--	--	1.4	--	--	--	--
All types	3,801.6	402.8	317.3	305.0	437.7	563.6	446.6	329.0	202.0	187.0	195.7	237.2	118.7	59.0

Table 13.--Area of commercial forest land by forest type and site-index class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Forest type	All classes	Site-index class (feet)								
		11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91+
Jack pine	229.1	--	11.8	60.4	48.3	76.7	25.1	5.2	1.6	--
Red pine	139.8	--	--	--	33.5	58.6	46.0	1.7	--	--
White pine	68.7	--	--	11.2	21.5	26.5	4.8	3.0	1.7	--
Balsam fir	217.4	1.5	3.0	15.0	67.0	97.3	29.0	3.1	--	1.5
White spruce	30.1	--	--	6.0	7.2	2.8	11.1	3.0	--	--
Black spruce	283.1	--	13.4	127.7	114.6	21.5	4.4	1.5	--	--
Northern white-cedar	594.9	43.0	303.3	161.6	60.1	14.3	8.0	4.6	--	--
Tamarack	43.8	--	4.6	19.2	13.6	4.8	1.6	--	--	--
Oak-hickory	19.3	--	--	1.5	0.4	4.6	6.6	6.2	--	--
Elm-ash-soft maple	191.8	--	1.5	25.2	54.0	57.7	39.6	10.8	3.0	--
Maple-birch	1,160.3	--	12.3	32.1	136.9	319.2	428.7	186.6	38.1	6.4
Aspen	671.4	--	--	25.9	77.2	157.9	204.3	160.8	40.3	5.0
Paper birch	110.5	--	--	6.3	13.8	47.6	36.6	4.7	1.5	--
Exotic	1.2	--	--	--	--	--	1.2	--	--	--
Nonstocked	40.2	1.7	0.7	3.2	13.6	14.3	3.6	3.1	--	--
All types	3,801.6	46.2	350.6	495.3	661.7	903.8	850.6	394.3	86.2	12.9

Table 14.--Area of commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Forest type and stand-size class	All classes	Basal area class (square feet per acre)													
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-150	151-180	181+
Jack pine															
Sawtimber	38.1	--	--	--	1.4	8.6	4.2	7.4	6.1	1.7	2.6	6.1	--	--	--
Poletimber	162.1	--	1.5	13.2	13.2	19.8	10.1	7.2	12.7	7.8	26.5	31.5	18.6	--	--
Sapling & seedling	28.9	12.2	7.2	1.5	6.1	--	--	--	1.9	--	--	--	--	--	--
All stands	229.1	12.2	8.7	14.7	20.7	28.4	14.3	14.6	20.7	9.5	29.1	37.6	18.6	--	--
Red pine															
Sawtimber	38.4	--	1.9	--	1.5	1.4	1.4	1.7	5.8	--	5.7	6.7	7.8	3.0	1.5
Poletimber	59.8	--	--	--	--	2.3	1.8	2.9	18.9	--	--	16.8	2.1	7.5	7.5
Sapling & seedling	41.6	--	5.7	4.7	14.9	--	16.3	--	--	--	--	--	--	--	--
All stands	139.8	--	7.6	4.7	16.4	3.7	19.5	4.6	24.7	--	5.7	23.5	9.9	10.5	9.0
White pine															
Sawtimber	43.3	--	--	1.4	1.7	1.7	3.0	1.5	10.0	0.8	6.6	13.5	1.7	1.4	--
Poletimber	15.3	--	--	--	--	4.8	1.5	1.4	--	--	--	7.6	--	--	--
Sapling & seedling	10.1	1.5	3.4	--	1.7	--	--	3.5	--	--	--	--	--	--	--
All stands	68.7	1.5	3.4	1.4	3.4	6.5	4.5	6.4	10.0	0.8	6.6	21.1	1.7	1.4	--
Balsam fir															
Sawtimber	48.7	--	--	--	--	--	1.5	--	--	3.3	4.6	31.7	4.7	--	2.9
Poletimber	102.6	--	--	--	1.2	5.0	--	3.1	18.7	9.2	21.7	16.5	15.3	5.8	6.1
Sapling & seedling	66.1	1.4	1.5	6.4	11.5	11.4	7.9	6.8	6.2	5.0	4.9	1.6	1.5	--	--
All stands	217.4	1.4	1.5	6.4	12.7	16.4	9.4	9.9	24.9	17.5	31.2	49.8	21.5	5.8	9.0
White spruce															
Sawtimber	10.4	--	--	--	1.5	--	--	--	--	--	--	1.5	1.5	2.9	3.0
Poletimber	10.5	--	--	--	--	--	--	--	--	--	3.1	1.5	4.4	--	1.5
Sapling & seedling	9.2	--	4.9	--	1.6	--	--	2.7	--	--	--	--	--	--	--
All stands	30.1	--	4.9	--	3.1	--	--	2.7	--	--	3.1	3.0	5.9	2.9	4.5
Black spruce															
Sawtimber	6.5	--	--	--	--	--	1.8	--	1.5	1.5	--	1.7	--	--	--
Poletimber	149.7	1.5	--	--	40.8	4.3	6.1	8.3	7.7	4.7	15.4	53.0	6.3	1.6	--
Sapling & seedling	126.9	5.9	32.0	12.7	11.6	16.6	9.3	11.7	8.0	3.8	7.6	6.1	1.6	--	--
All stands	283.1	7.4	32.0	12.7	52.4	20.9	17.2	20.0	17.2	10.0	23.0	60.8	7.9	1.6	--
Northern white-cedar															
Sawtimber	131.9	--	--	--	4.8	1.6	3.0	3.3	7.3	--	2.8	31.3	24.4	29.8	23.6
Poletimber	305.9	--	--	--	3.2	1.8	1.5	4.7	6.0	10.1	19.7	39.3	79.2	66.9	73.5
Sapling & seedling	157.1	4.5	7.8	3.4	7.5	8.5	7.2	16.5	16.9	6.1	8.9	18.5	28.2	21.5	1.6
All stands	594.9	4.5	7.8	3.4	15.5	11.9	11.7	24.5	30.2	16.2	31.4	89.1	131.8	118.2	98.7

(Table 14 continued on next page)

(Table 14 continued)

Forest type and stand-size class	All classes	Basal area class (square feet per acre)													
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-150	151-180	181+
Tamarack															
Sawtimber	1.4	--	--	--	--	--	--	--	1.4	--	--	--	--	--	--
Poletimber	19.6	--	--	--	1.5	3.6	1.7	4.7	1.5	3.3	3.3	--	--	--	--
Sapling & seedling	22.8	1.2	1.5	1.4	3.0	3.2	4.5	--	1.6	3.2	1.6	--	1.6	--	--
All stands	43.8	1.2	1.5	1.4	4.5	6.8	6.2	4.7	4.5	6.5	4.9	--	1.6	--	--
Oak-hickory															
Sawtimber	6.3	--	--	--	1.6	--	--	1.6	1.6	--	--	1.5	--	--	--
Poletimber	11.4	--	--	--	--	--	1.5	4.6	1.5	1.5	0.8	1.5	--	--	--
Sapling & seedling	1.6	--	--	--	--	--	--	1.6	--	--	--	--	--	--	--
All stands	19.3	--	--	--	1.6	--	1.5	7.8	3.1	1.5	0.8	3.0	--	--	--
Elm-ash-soft maple															
Sawtimber	58.8	--	--	--	--	3.7	1.5	1.5	12.5	--	0.6	10.9	16.3	10.4	1.4
Poletimber	70.7	--	--	--	2.6	4.7	2.6	7.8	4.8	1.5	15.1	6.0	20.2	5.4	--
Sapling & seedling	62.3	1.0	6.4	4.8	6.5	4.7	9.4	11.3	4.4	3.0	4.7	3.1	3.0	--	--
All stands	191.8	1.0	6.4	4.8	9.1	13.1	13.5	20.6	21.7	4.5	20.4	20.0	39.5	15.8	1.4
Maple-birch															
Sawtimber	519.0	--	1.5	--	5.2	3.2	1.8	20.5	54.6	47.9	73.7	126.5	117.2	44.8	22.1
Poletimber	483.7	--	1.9	2.5	7.8	6.1	6.3	16.6	33.7	39.5	77.1	114.0	135.4	39.9	2.9
Sapling & seedling	157.6	10.4	3.3	7.0	12.8	27.6	13.5	27.2	21.7	17.0	4.5	11.2	1.4	--	--
All stands	1,160.3	10.4	6.7	9.5	25.8	36.9	21.6	64.3	110.0	104.4	155.3	251.7	254.0	84.7	25.0
Aspen															
Sawtimber	93.6	--	--	2.1	1.5	18.9	1.5	5.4	10.1	6.0	9.0	3.0	21.2	7.6	7.3
Poletimber	353.6	--	5.4	3.4	7.6	10.2	12.2	26.8	17.4	48.4	59.7	44.9	53.8	53.2	10.6
Sapling & seedling	224.2	23.2	32.2	50.3	35.5	35.7	20.1	6.2	8.8	4.4	4.8	1.5	1.5	--	--
All stands	671.4	23.2	37.6	55.8	44.6	64.8	33.8	38.4	36.3	58.8	73.5	49.4	76.5	60.8	17.9
Paper birch															
Sawtimber	9.6	--	--	--	--	--	--	3.1	--	--	--	1.5	5.0	--	--
Poletimber	79.0	--	--	--	--	6.8	6.6	6.3	6.7	--	25.5	12.1	9.1	2.9	3.0
Sapling & seedling	21.9	3.2	--	3.2	3.1	4.9	--	3.0	1.4	1.5	1.6	--	--	--	--
All stands	110.5	3.2	--	3.2	3.1	11.7	6.6	12.4	8.1	1.5	27.1	13.6	14.1	2.9	3.0
Exotic															
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	1.2	--	--	--	--	--	--	--	--	--	--	1.2	--	--	--
Sapling & seedling	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All stands	1.2	--	--	--	--	--	--	--	--	--	--	1.2	--	--	--
Nonstocked	40.2	25.2	11.0	2.2	0.5	0.4	0.4	--	0.5	--	--	--	--	--	--
All types															
Sawtimber	1,006.0	--	3.4	3.5	19.2	39.1	19.7	46.0	110.9	61.2	105.6	235.9	199.8	99.9	61.8
Poletimber	1,825.1	1.5	8.8	19.1	77.9	69.4	51.9	94.4	129.6	126.0	267.9	345.9	344.4	183.2	105.1
Sapling & seedling	930.3	64.5	105.9	95.4	115.8	112.6	88.2	90.5	70.9	44.0	38.6	42.0	38.8	21.5	1.6
Nonstocked	40.2	25.2	11.0	2.2	0.5	0.4	0.4	--	0.5	--	--	--	--	--	--
All stands	3,801.6	91.2	129.1	120.2	213.4	221.5	160.2	230.9	311.9	231.2	412.1	623.8	583.0	304.6	168.5

Table 15.--Area of commercial forest land by stocking class of growing-stock trees and stand-size class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Stocking class (percent)	All stands	Stand-size class			
		Sawtimber stands	Poletimber stands	Sapling and seedling stands	Nonstocked areas
Less than 16.7	40.2	--	--	--	40.2
16.7 to 60.9	663.8	91.4	334.9	237.5	--
61.0 to 100.9	1,381.5	402.6	666.5	312.4	--
101.0 to 133.9	1,385.8	437.5	664.5	283.8	--
134.0+	330.3	74.5	159.2	96.6	--
All classes	3,801.6	1,006.0	1,825.1	930.3	40.2

Table 16.--Area of commercial forest land by stocking class based on selected stand components, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Stocking class (percent)	Stocking classified in terms of				
	All live trees	Growing stock trees	Desirable trees	Acceptable trees	Rough and rotten trees
0-10	16.7	27.9	3,756.7	27.9	2,245.1
11-20	20.5	88.1	34.6	90.8	965.2
21-30	110.7	77.1	8.7	75.8	385.1
31-40	60.3	124.9	1.6	135.2	129.2
41-50	172.1	208.9	--	200.5	52.2
51-60	151.5	177.1	--	188.3	18.6
61-70	202.5	201.4	--	201.9	3.1
71-80	158.6	265.6	--	299.8	3.1
81-90	276.8	409.8	--	401.1	--
91-100	346.4	504.6	--	520.3	--
101-110	381.7	480.8	--	467.9	--
111-120	512.2	439.5	--	441.0	--
121-130	498.9	372.8	--	354.1	--
131-140	449.5	258.3	--	247.7	--
141-150	260.1	120.7	--	108.4	--
151-160	181.5	44.1	--	40.9	--
161+	1.6	--	--	--	--
Total	3,801.6	3,801.6	3,801.6	3,801.6	3,801.6

Table 17.--Area of noncommercial forest land by ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Ownership class	All areas	Productive-reserved areas	Unproductive areas
National Forest	58.3	15.3[1/]	43.0
Bureau of Land Management	--	--	--
Indian	--	--	--
Miscellaneous federal	33.1	33.1	--
State	113.6	77.6	36.0
County and municipal	1.7	0.1	1.6
Forest industry	6.1	--	6.1
Farmer	6.5	1.5	5.0
Misc. private-corp.	4.8	--	4.8
Misc. private-indiv.	5.9	--	5.9
Total	230.0	127.6	102.4

[1/] Includes 14.9 thousand acres of productive-deferred areas.

Table 18.--Area of noncommercial forest land by forest type, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Forest type	All areas	Productive-reserved areas[1/]	Unproductive areas
Jack pine	2.2	1.3	0.9
Red pine	3.7	3.6	0.1
White pine	1.2	1.2	--
Balsam fir	18.9	18.6	0.3
White spruce	4.6	3.1	1.5
Black spruce	50.1	3.7	46.4
Northern white-cedar	29.9	1.9	28.0
Tamarack	8.7	--	8.7
Oak-hickory	0.7	0.7	--
Elm-ash-soft maple	10.3	5.9	4.4
Maple-birch	41.2	40.5	0.7
Aspen	38.7	38.3	0.4
Paper birch	8.9	6.7	2.2
Exotic	--	--	--
Nonstocked	10.9	2.1	8.8
All types	230.0	127.6	102.4

[1/] Includes 14.9 thousand acres of productive-deferred areas.

Table 19.--Area of nonforest land with trees by forest type and land use, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

Forest type	All uses	Land use							
		Cropland	Improved pasture	Wooded strips	Idle farmland	Marsh	Wind-breaks	Urban and other windbreaks	Wooded pasture
Jack pine	--	--	--	--	--	--	--	--	--
Red pine	1.8	--	--	1.8	--	--	--	--	--
White pine	--	--	--	--	--	--	--	--	--
Balsam fir	3.4	1.7	--	--	--	1.7	--	--	--
White spruce	--	--	--	--	--	--	--	--	--
Black spruce	19.7	--	--	1.8	--	17.9	--	--	--
Northern white-cedar	9.8	--	--	1.9	--	7.9	--	--	--
Tamarack	3.5	--	--	--	--	3.5	--	--	--
Oak-hickory	--	--	--	--	--	--	--	--	--
Elm-ash-soft maple	3.2	--	--	--	--	3.2	--	--	--
Maple-birch	10.3	1.7	1.5	5.4	--	1.7	--	--	--
Aspen	29.7	--	1.0	14.0	1.8	11.2	1.7	--	--
Paper birch	1.9	--	--	--	--	1.9	--	--	--
Exotic	--	--	--	--	--	--	--	--	--
All types	83.3	3.4	2.5	24.9	1.8	49.0	1.7	--	--

Table 20.--Number of all live trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand trees)

Species group	All classes	Diameter class (inches at breast height) 1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
SOFTWOODS															
White pine	23,900	9,518	3,493	3,035	2,011	1,503	1,374	1,230	689	331	338	193	153	32	--
Red pine	46,176	11,404	14,660	8,867	6,695	2,032	1,172	507	542	191	67	24	15	--	--
Jack pine	69,026	12,451	15,887	20,229	14,037	4,860	1,056	337	78	88	3	--	--	--	--
White spruce	43,221	15,688	7,626	9,335	4,260	3,577	1,597	706	220	152	31	22	7	--	--
Black spruce	199,412	90,819	60,825	35,679	9,388	2,107	415	56	38	8	77	--	--	--	--
Balsam fir	446,880	277,420	100,653	47,311	15,394	4,216	1,394	408	60	24	--	--	--	--	--
Hemlock	36,599	12,549	8,115	4,130	3,748	2,648	1,971	1,535	1,014	374	238	158	115	4	--
Tamarack	47,308	22,741	14,942	6,540	1,884	921	185	69	22	4	--	--	--	--	--
Northern white-cedar	535,697	234,367	150,778	86,424	38,444	15,924	6,093	2,317	826	306	120	49	41	6	2
Other softwoods	941	117	470	187	119	48	--	--	--	--	--	--	--	--	--
Total	1,449,160	687,074	377,449	221,737	95,980	37,836	15,257	7,165	3,489	1,478	874	446	331	42	2
HARDWOODS															
Select white oaks	304	265	--	--	--	33	--	6	--	--	--	--	--	--	--
Select red oaks	4,774	1,235	883	1,010	603	491	233	145	86	40	22	17	9	--	--
Other red oaks	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	32,639	14,449	6,177	3,962	2,195	1,995	1,358	1,073	659	381	155	123	92	18	2
Hard maple	327,784	188,275	68,868	29,638	19,291	10,148	5,431	2,960	1,779	813	327	127	100	27	--
Soft maple	293,373	145,458	69,477	36,967	21,258	10,317	5,008	2,784	1,125	607	230	76	60	6	--
Beech	67,613	40,410	9,402	5,999	3,414	2,498	2,136	1,776	991	613	219	84	69	2	--
Ash	121,189	74,000	31,494	10,138	3,196	1,362	649	250	52	29	17	--	--	2	--
Balsam poplar	46,879	20,028	11,116	6,071	3,850	2,641	1,571	965	387	145	79	24	2	--	--
Cottonwood	15	--	--	--	--	--	--	11	4	--	--	--	--	--	--
Bigtooth aspen	14,645	2,267	2,531	3,434	3,453	1,778	594	402	103	69	12	2	--	--	--
Quaking aspen	183,331	87,860	34,212	27,482	16,799	9,459	4,679	1,770	723	255	66	24	2	--	--
Basswood	11,642	2,659	2,700	2,300	1,493	1,225	790	275	108	56	23	9	4	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	33,036	15,168	7,319	5,348	2,821	1,092	952	236	74	16	8	2	--	--	--
Butternut	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm	14,002	5,951	2,548	2,232	1,386	799	430	365	149	92	28	12	7	3	--
Paper birch	111,347	35,024	32,035	21,843	13,173	5,748	2,320	847	265	58	21	5	8	--	--
Other hardwoods	325	302	--	--	17	--	--	6	--	--	--	--	--	--	--
Noncommercial species	47,336	37,137	7,438	1,821	628	246	54	12	--	--	--	--	--	--	--
Total	1,310,234	670,488	286,200	158,245	93,577	49,832	26,205	13,883	6,505	3,174	1,207	505	353	58	2
All species	2,759,394	1,357,562	663,649	379,982	189,557	87,668	41,462	21,048	9,994	4,652	2,081	951	684	100	4

Table 21.--Number of growing-stock trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand trees)

Species group	All classes	Diameter class (inches at breast height) 1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
SOFTWOODS															
White pine	22,656	9,519	3,493	2,636	1,714	1,290	1,160	1,186	667	302	318	193	147	31	--
Red pine	45,892	11,404	14,523	8,752	6,683	2,012	1,172	507	542	191	67	24	15	--	--
Jack pine	66,717	12,010	15,748	19,638	13,215	4,578	1,032	330	74	89	3	--	--	--	--
White spruce	40,034	15,523	7,626	6,462	4,194	3,536	1,567	706	220	143	28	22	7	--	--
Black spruce	195,675	87,860	60,667	35,261	9,269	2,032	407	56	38	8	77	--	--	--	--
Balsam fir	437,343	272,009	98,355	46,353	14,846	4,082	1,282	336	60	20	--	--	--	--	--
Hemlock	33,026	11,802	7,671	3,260	3,297	2,225	1,668	1,405	897	344	201	142	110	4	--
Tamarack	44,571	21,403	14,166	6,136	1,754	853	164	69	22	4	--	--	--	--	--
Northern white-cedar	486,791	218,140	139,456	76,739	32,636	12,513	4,670	1,712	625	183	70	22	23	2	--
Other softwoods	913	117	470	159	119	48	--	--	--	--	--	--	--	--	--
Total	1,373,618	659,787	362,175	205,396	87,727	33,169	13,122	6,307	3,145	1,284	764	403	302	37	--
HARDWOODS															
Select white oaks	290	264	--	--	--	20	--	6	--	--	--	--	--	--	--
Select red oaks	4,274	1,234	732	797	526	480	210	139	82	40	19	11	4	--	--
Other red oaks	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	25,824	11,236	5,105	3,243	1,762	1,591	1,011	816	543	278	93	82	52	10	2
Hard maple	306,285	176,887	63,774	27,709	18,310	9,396	4,751	2,625	1,626	721	299	111	69	7	--
Soft maple	261,301	130,370	61,688	32,955	18,827	8,983	4,350	2,418	894	518	204	55	37	2	--
Beech	60,559	37,728	8,680	5,125	2,520	2,012	1,616	1,375	827	437	161	49	27	2	--
Ash	103,166	63,245	26,270	8,787	2,775	1,254	535	218	43	22	17	--	--	--	--
Balsam poplar	43,284	18,518	10,241	5,707	3,564	2,435	1,412	806	369	139	71	22	--	--	--
Cottonwood	15	--	--	--	--	--	--	11	4	--	--	--	--	--	--
Bigtooth aspen	12,989	1,657	2,372	3,106	3,194	1,651	546	318	74	62	9	--	--	--	--
Quaking aspen	164,021	81,568	30,508	23,465	14,672	7,815	3,977	1,398	421	125	52	18	2	--	--
Basswood	10,744	2,368	2,559	2,149	1,406	1,133	708	248	92	53	18	6	4	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	23,514	13,639	2,968	2,856	2,173	836	779	192	54	10	5	2	--	--	--
Butternut	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm	12,475	5,372	2,408	1,837	1,186	687	407	324	136	81	24	9	3	1	--
Paper birch	100,133	32,353	27,548	19,868	12,009	5,233	2,113	734	219	42	5	5	4	--	--
Other hardwoods	325	302	--	--	17	--	--	6	--	--	--	--	--	--	--
Total	1,129,199	576,741	244,853	137,604	82,941	43,526	22,415	11,634	5,384	2,528	977	370	202	22	2
All species	2,502,817	1,236,528	607,028	343,000	170,668	76,695	35,537	17,941	8,529	3,812	1,741	773	504	59	2

Table 22.--Number of short-log trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand trees)

Species group	All classes	Diameter class (inches at breast height) 9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
SOFTWOODS											
White pine	157	78	42	23	9	--	3	--	2	--	--
Red pine	20	20	--	--	--	--	--	--	--	--	--
Jack pine	162	143	10	4	5	--	--	--	--	--	--
White spruce	38	21	8	--	--	6	3	--	--	--	--
Black spruce	66	57	9	--	--	--	--	--	--	--	--
Balsam fir	153	64	75	10	--	4	--	--	--	--	--
Hemlock	272	117	66	39	21	9	14	2	4	--	--
Tamarack	20	20	--	--	--	--	--	--	--	--	--
Northern white-cedar	1,000	487	247	155	48	24	27	4	7	1	--
Other softwoods	--	--	--	--	--	--	--	--	--	--	--
Total	1,888	1,007	457	231	83	43	47	6	13	1	--
HARDWOODS											
Select white oaks	--	--	--	--	--	--	--	--	--	--	--
Select red oaks	33	--	15	6	4	--	--	6	2	--	--
Other red oaks	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	300	--	139	66	34	31	14	4	8	4	--
Hard maple	650	--	388	127	58	43	17	5	9	3	--
Soft maple	405	--	173	83	93	33	3	14	6	--	--
Beech	289	--	112	77	28	27	20	11	14	--	--
Ash	99	--	66	20	10	3	--	--	--	--	--
Balsam poplar	59	--	43	8	--	3	5	--	--	--	--
Cottonwood	--	--	--	--	--	--	--	--	--	--	--
Bigtooth aspen	26	--	8	--	12	4	--	2	--	--	--
Quaking aspen	310	--	169	103	29	7	--	2	--	--	--
Basswood	47	--	21	17	7	--	--	2	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--
Black cherry	41	--	18	16	4	3	--	--	--	--	--
Butternut	--	--	--	--	--	--	--	--	--	--	--
Elm	3	--	--	--	--	3	--	--	--	--	--
Paper birch	157	--	81	42	17	6	9	--	2	--	--
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--
Total	2,419	--	1,233	565	296	163	68	46	41	7	--
All species	4,307	1,007	1,690	796	379	206	115	52	54	8	--

Table 23.--Net volume of growing stock on commercial forest land by species group, Eastern Upper Peninsula, Michigan, 1966 and 1980

(In million cubic feet)

Species group	1966	1980
SOFTWOODS		
White pine	111.0	146.1
Red pine	109.6	138.9
Jack pine	137.4	174.3
White spruce	97.7	148.6
Black spruce	104.1	171.0
Balsam fir	266.2	259.3
Hemlock	147.1	133.4
Tamarack	30.2	42.5
Northern white-cedar	445.8	532.9
Other softwoods	--	1.4
Total	1,449.1	1,748.3
HARDWOODS		
Select white oak	0.2	0.4
Select red oak	17.0	21.7
Other red oak	--	--
Hickory	--	--
Yellow birch	122.2	99.7
Hard maple	480.3	536.4
Soft maple	289.3	477.5
Beech	195.6	168.3
Ash	47.5	66.6
Balsam poplar	68.4	89.7
Cottonwood	0.5	0.4
Bigtooth aspen	68.1	66.6
Quaking aspen	265.0	363.8
Basswood	71.2	50.4
Yellow-poplar	--	--
Black walnut	--	--
Black cherry	25.4	49.7
Butternut	--	--
Elm	100.3	41.2
Paper birch	203.0	253.9
Other hardwoods	--	0.2
Total	1,954.0	2,286.5
All species	3,403.1	4,034.7

Table 24.--Net volume of all live trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Species group	All classes	Diameter class (inches at breast height) 5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
SOFTWOODS													
White pine	152,530	5,698	8,181	11,396	16,252	24,321	19,992	12,981	17,978	13,892	16,345	5,494	--
Red pine	139,208	21,791	36,014	19,795	18,467	12,072	17,216	7,887	3,316	1,558	1,092	--	--
Jack pine	179,425	47,903	67,024	39,813	13,666	6,168	1,911	2,847	93	--	--	--	--
White spruce	152,854	20,858	25,924	39,281	28,369	18,738	8,088	7,379	1,764	1,741	712	--	--
Black spruce	172,178	86,775	50,792	19,777	6,732	1,435	1,292	415	4,960	--	--	--	--
Balsam fir	264,271	111,975	79,081	40,454	21,034	8,486	2,129	1,112	--	--	--	--	--
Hemlock	144,457	7,315	14,319	17,410	20,561	24,952	23,016	11,281	9,131	7,712	8,123	551	86
Tamarack	43,578	16,398	11,727	10,257	2,953	1,544	593	106	--	--	--	--	--
Northern white-cedar	585,294	185,276	159,268	108,463	63,175	34,267	17,189	7,976	4,285	1,935	2,479	669	312
Other softwoods	1,477	461	660	356	--	--	--	--	--	--	--	--	--
Total	1,835,272	504,450	452,990	307,002	191,209	131,983	91,426	51,984	41,527	26,838	28,751	6,714	398
HARDWOODS													
Select white oaks	460	--	--	341		119	--	--	--	--	--	--	--
Select red oaks	23,554	2,320	3,293	4,695	3,488	3,181	2,519	1,570	957	951	580	--	--
Other red oaks	--	--	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	119,326	9,339	10,508	16,439	16,081	19,029	15,976	11,848	5,918	5,869	5,913	1,914	493
Hard maple	574,072	86,300	115,830	102,775	85,163	65,513	53,473	31,754	15,893	7,426	6,960	2,985	--
Soft maple	524,530	100,560	122,208	101,992	74,170	58,061	29,967	20,614	9,684	3,427	3,375	472	--
Beech	201,732	18,329	20,760	25,753	32,798	37,722	28,001	20,964	9,245	4,029	3,904	227	--
Ash	71,999	25,447	15,867	12,685	9,206	5,030	1,555	1,079	853	--	--	277	--
Balsam poplar	94,115	9,443	13,820	17,290	16,985	15,705	10,264	5,078	3,890	1,527	113	--	--
Cottonwood	368	--	--	--	--	238	130	--	--	--	--	--	--
Bigtooth aspen	71,097	10,409	20,771	17,101	9,123	7,882	2,745	2,459	523	84	--	--	--
Quaking aspen	409,036	79,747	99,266	92,613	70,300	37,198	18,102	7,535	2,862	1,286	127	--	--
Basswood	53,114	6,706	8,608	12,024	12,333	6,191	3,238	2,211	1,064	484	255	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	59,735	11,476	15,461	10,891	14,145	5,107	1,822	466	276	91	--	--	--
Butternut	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm	44,799	5,839	7,382	7,453	6,508	7,630	4,092	3,348	1,173	613	430	331	--
Paper birch	273,735	75,649	81,775	56,784	33,849	16,129	6,525	1,860	562	261	341	--	--
Other hardwoods	239	--	104	--	--	135	--	--	--	--	--	--	--
Noncommercial species	9,482	4,049	2,732	1,873	629	199	--	--	--	--	--	--	--
Total	2,531,393	445,613	538,385	480,709	384,778	285,069	178,409	110,786	52,900	26,047	21,998	6,206	493
All species	4,366,665	950,063	991,375	787,711	575,987	417,052	269,835	162,770	94,427	52,885	50,749	12,920	891

Table 25.--Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Class of timber	All species	Softwoods	Hardwoods
LIVE TREES			
Growing-stock trees			
Sawtimber			
Saw log portion	1,550,826	725,132	825,694
Upper stem portion	216,503	100,463	116,040
Subtotal	1,767,329	825,595	941,734
Poletimber	2,267,415	922,689	1,344,726
Total	4,034,744	1,748,284	2,286,460
Cull trees			
Rough and rotten cull trees			
Sawtimber	118,793	35,441	83,352
Poletimber	154,731	34,751	119,980
Subtotal	273,524	70,192	203,332
Short-log trees	58,397	16,796	41,601
Total	331,921	86,988	244,933
TOTAL LIVE TREES	4,366,665	1,835,272	2,531,393
SALVABLE DEAD TREES	167,245	81,639	85,606
ALL CLASSES	4,533,910	1,916,911	2,616,999

Table 26.--Net volume of growing stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species, Eastern Upper Peninsula, Michigan, 1980

Species	Total all live	Growing stock	Short-log cull	Rough and rotten cull	Sawtimber
	- - - - - - - - Thousand cubic feet - - - - - - - -				Thousand board feet 1/
SOFTWOODS					
White pine	152,530	146,073	1,458	4,999	736,589
Red pine	139,208	138,860	110	238	447,746
Jack pine	179,425	174,266	1,004	4,155	309,368
Scotch pine	1,396	1,359	--	37	1,602
White spruce	152,854	148,642	435	3,777	527,783
Norway spruce	--	--	--	--	--
Engelmann spruce	81	81	--	--	--
Black spruce	172,178	170,997	360	821	169,698
Balsam fir	264,271	259,257	1,322	3,692	323,226
Hemlock	144,457	133,434	2,884	8,139	661,391
Tamarack	43,578	42,467	123	988	66,942
Northern white-cedar	585,294	532,848	9,100	43,346	996,280
Eastern redcedar	--	--	--	--	--
Total	1,835,272	1,748,284	16,796	70,192	4,240,625
HARDWOODS					
White oak	109	109	--	--	--
Bur oak	351	249	--	102	637
Swamp white oak	--	--	--	--	--
Northern red oak	23,554	21,707	811	1,036	65,731
Shellbark hickory	--	--	--	--	--
Yellow birch	119,326	99,743	5,090	14,493	367,659
Black maple	--	--	--	--	--
Sugar maple	574,072	536,418	11,404	26,250	1,366,336
Red maple	524,116	477,039	7,212	39,865	945,765
Silver maple	414	414	--	--	1,278
American beech	201,732	168,298	6,340	27,094	653,154
White ash	17,348	16,865	373	110	32,666
Black ash	48,623	44,349	682	3,592	44,101
Green ash	6,028	5,427	262	339	11,329
Balsam poplar	94,115	89,733	834	3,548	278,417
Paper birch	273,735	253,926	2,365	17,444	287,113
Bigtooth aspen	71,097	66,570	482	4,045	112,159
Quaking aspen	409,036	363,836	4,210	40,990	638,290
Basswood	53,114	50,367	829	1,918	132,115
American elm	42,342	38,701	105	3,536	123,331
Slippery elm	122	122	--	--	680
Rock elm	2,335	2,335	--	--	--
Black cherry	59,735	49,645	602	9,488	91,220
Boxelder	--	--	--	--	--
River birch	--	--	--	--	--
Sweet birch	104	104	--	--	--
Eastern cottonwood	368	368	--	--	1,936
Black willow	--	--	--	--	--
Ohio buckeye	135	135	--	--	665
Flowering dogwood	--	--	--	--	--
Black locust	--	--	--	--	--
Noncommercial species	9,482	--	--	9,482	--
Total	2,531,393	2,286,460	41,601	203,332	5,154,582
All species	4,366,665	4,034,744	58,397	273,524	9,395,207

1/International 1/4-inch rule.

Table 27.--Net volume of noncommercial species (nongrowing-stock volume) on commercial forest land by individual species, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Species	Nongrowing-stock (rough tree) volume
Striped maple	827
Mountain maple	90
Ailanthus	--
American hornbeam	--
Eastern hophornbeam	8,020
Eastern redbud	--
Hawthorn	--
Apple	157
Pin cherry	239
Chokecherry	--
Mountain ash	149
Peachleaf willow	--
Diamond willow	--
All species	9,482

Table 28.--Net volume of growing stock on commercial forest land by county and species group, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Species group	All counties	County						
		Alger	Chippewa	Delta	Luce	Mackinac	Menominee	Schoolcraft
SOFTWOODS								
White pine	146,073	20,170	18,471	12,848	34,251	13,821	17,027	29,485
Red pine	138,860	16,613	27,655	27,691	20,669	17,617	1,926	26,689
Jack pine	174,266	10,757	67,334	25,088	26,079	13,747	1,616	29,645
White spruce	148,642	19,816	32,046	29,901	10,915	35,310	7,240	13,414
Black spruce	170,997	9,002	47,159	27,395	21,843	27,915	11,071	26,612
Balsam fir	259,257	31,293	47,266	52,136	31,024	45,228	22,675	29,635
Hemlock	133,434	38,512	12,343	17,751	25,913	9,038	11,626	18,251
Tamarack	42,467	750	4,528	4,640	6,302	5,495	13,496	7,256
Northern white-cedar	532,848	56,335	77,642	81,695	64,408	82,242	102,783	67,743
Other softwoods	1,440	--	1,052	--	307	--	--	81
Total	1,748,284	203,248	335,496	279,145	241,711	250,413	189,460	248,811
HARDWOODS								
Select white oaks	358	--	--	--	--	--	358	--
Select red oaks	21,707	72	6,765	1,996	819	1,733	10,236	86
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	99,743	30,148	17,938	13,657	10,814	9,940	4,595	12,651
Hard maple	536,418	154,397	75,681	49,016	69,793	70,754	66,268	50,509
Soft maple	477,453	105,298	75,844	62,394	83,532	51,146	28,540	70,699
Beech	168,298	59,185	29,648	9,459	33,601	16,138	2,480	17,787
Ash	66,641	7,661	7,451	14,807	3,126	3,983	25,340	4,273
Balsam poplar	89,733	2,353	21,008	20,345	3,257	23,478	12,151	7,141
Cottonwood	368	--	368	--	--	--	--	--
Bigtooth aspen	66,570	4,074	13,246	12,106	4,880	17,584	6,871	7,809
Quaking aspen	363,836	16,468	96,298	69,496	32,514	68,589	47,301	33,170
Basswood	50,367	6,112	4,855	6,807	1,371	7,785	21,293	2,144
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	49,645	17,271	5,626	4,837	5,762	4,722	2,114	9,313
Butternut	--	--	--	--	--	--	--	--
Elm	41,158	17,501	2,807	6,019	915	4,478	7,712	1,726
Paper birch	253,926	9,245	48,493	45,169	17,567	61,157	34,025	38,270
Other hardwoods	239	135	104	--	--	--	--	--
Total	2,286,460	429,920	406,132	316,108	267,951	341,487	269,284	255,578
All species	4,034,744	633,168	741,628	595,253	509,662	591,900	458,744	504,389

Table 29.--Net volume of sawtimber on commercial forest land by county and species group, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1/]

Species group	All counties	County						
		Alger	Chippewa	Delta	Luce	Mackinac	Menominee	Schoolcraft
SOFTWOODS								
White pine	736,589	106,506	95,818	65,892	171,008	68,717	85,728	142,920
Red pine	447,746	47,672	78,218	74,418	87,859	57,362	7,672	94,545
Jack pine	309,368	17,428	107,336	42,419	48,449	33,549	429	59,758
White spruce	527,783	71,487	114,980	109,150	34,638	122,132	29,812	45,584
Black spruce	169,698	13,042	52,534	23,767	21,229	29,627	6,081	23,418
Balsam fir	323,226	37,449	57,445	59,752	49,451	58,284	21,103	39,742
Hemlock	661,391	199,234	64,050	77,804	135,634	43,085	52,910	88,674
Tamarack	66,942	2,421	10,529	7,207	12,407	10,241	11,474	12,663
Northern white-cedar	996,280	153,667	158,395	113,780	177,581	132,121	150,605	110,131
Other softwoods	1,602	--	912	--	690	--	--	--
Total	4,240,625	648,906	740,217	574,189	738,946	555,118	365,814	617,435
HARDWOODS								
Select white oaks	637	--	--	--	--	--	637	--
Select red oaks	65,731	--	22,147	8,531	546	2,236	32,271	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	367,659	116,722	63,885	45,425	44,987	34,927	9,701	52,012
Hard maple	1,366,336	452,443	162,544	116,505	223,358	177,115	109,642	124,729
Soft maple	947,043	234,842	166,851	76,781	194,900	85,204	47,813	140,652
Beech	653,154	241,466	120,172	35,689	137,336	47,474	8,757	62,260
Ash	88,096	12,571	9,650	18,590	2,219	6,513	33,966	4,587
Balsam poplar	278,417	6,863	54,901	59,171	11,381	81,764	43,062	21,275
Cottonwood	1,936	--	1,936	--	--	--	--	--
Bigtooth aspen	112,159	10,249	29,728	20,131	8,352	22,015	8,622	13,062
Quaking aspen	638,290	37,596	193,279	88,153	66,865	126,220	66,655	59,522
Basswood	132,115	16,890	9,114	17,654	3,626	17,052	62,184	5,595
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	91,220	35,971	8,949	12,337	7,788	7,619	1,700	16,856
Butternut	--	--	--	--	--	--	--	--
Elm	124,011	58,223	9,303	17,901	1,378	15,336	16,769	5,101
Paper birch	287,113	15,578	67,218	43,489	24,603	61,474	25,607	49,144
Other hardwoods	665	665	--	--	--	--	--	--
Total	5,154,582	1,240,079	919,677	560,357	727,339	684,949	467,386	554,795
All species	9,395,207	1,888,985	1,659,894	1,134,546	1,466,285	1,240,067	833,200	1,172,230

[1/] International 1/4-inch rule.

Table 30.--Net volume of growing stock on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Species group	All classes	Diameter class (inches at breast height) 5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
SOFTWOODS													
White pine	146,073	5,087	7,327	10,367	14,744	23,789	19,655	12,402	17,402	13,892	16,046	5,362	--
Red pine	138,860	21,595	35,973	19,685	18,467	12,071	17,216	7,887	3,316	1,558	1,092	--	--
Jack pine	174,266	46,995	64,590	38,329	13,511	6,066	1,835	2,847	93	--	--	--	--
White spruce	148,642	17,627	25,696	39,129	28,077	18,738	8,088	7,165	1,669	1,741	712	--	--
Black spruce	170,997	86,349	50,510	19,380	6,655	1,435	1,293	415	4,960	--	--	--	--
Balsam fir	259,257	110,655	77,734	39,660	20,168	7,885	2,129	1,026	--	--	--	--	--
Hemlock	133,434	6,452	13,069	15,564	18,656	23,682	21,309	10,730	8,257	7,258	7,820	551	86
Tamarack	42,467	15,890	11,467	10,013	2,854	1,544	593	106	--	--	--	--	--
Northern white-cedar	532,848	176,212	148,377	97,265	55,443	29,072	14,726	5,851	2,934	1,095	1,647	226	--
Other softwoods	1,440	424	660	356	--	--	--	--	--	--	--	--	--
Total	1,748,284	487,286	435,403	289,748	178,575	124,282	86,844	48,429	38,631	25,544	27,317	6,139	86
HARDWOODS													
Select white oaks	358	--	--	239	--	119	--	--	--	--	--	--	--
Select red oaks	21,707	1,912	3,086	4,634	3,229	3,087	2,424	1,570	889	617	259	--	--
Other red oaks	--	--	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	99,743	8,597	9,348	14,430	13,279	15,937	13,971	9,496	4,159	4,586	4,173	1,274	493
Hard maple	536,418	81,933	111,579	97,414	77,086	60,588	50,394	29,327	14,961	6,814	5,385	937	--
Soft maple	477,453	92,835	112,246	92,770	68,022	53,038	25,902	18,531	8,891	2,694	2,336	188	--
Beech	168,298	16,617	17,283	22,332	26,979	31,678	24,795	16,612	7,341	2,605	1,829	227	--
Ash	66,641	23,443	14,817	12,347	8,246	4,647	1,353	936	852	--	--	--	--
Balsam poplar	89,733	9,052	13,277	16,697	16,065	14,576	10,049	4,925	3,647	1,445	--	--	--
Cottonwood	368	--	--	--	--	238	130	--	--	--	--	--	--
Bigtooth aspen	66,570	9,667	19,961	16,369	8,734	6,845	2,242	2,302	450	--	--	--	--
Quaking aspen	363,836	70,877	91,890	83,444	63,960	32,376	12,870	4,828	2,440	1,024	127	--	--
Basswood	50,367	6,404	8,337	11,523	11,663	5,772	2,942	2,154	927	390	255	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	49,645	8,185	13,344	9,298	12,367	4,407	1,441	311	201	91	--	--	--
Butternut	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm	41,158	5,240	6,643	6,825	6,293	7,128	3,894	3,124	1,099	532	239	141	--
Paper birch	253,926	70,714	76,305	52,709	31,626	14,577	5,772	1,523	222	261	217	--	--
Other hardwoods	239	--	103	--	--	136	--	--	--	--	--	--	--
Total	2,286,460	405,476	498,219	441,031	347,549	255,149	158,179	95,639	46,079	21,059	14,820	2,767	493
All species	4,034,744	892,762	933,622	730,779	526,124	379,431	245,023	144,068	84,710	46,603	42,137	8,906	579

Table 31.--Net volume of sawtimber on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1/]

Species group	All classes	Diameter class (inches at breast height) 9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
SOFTWOODS											
White pine	736,589	51,993	76,219	126,391	106,186	69,695	98,241	79,777	95,071	33,016	--
Red pine	447,746	108,486	100,954	65,579	94,699	44,110	18,218	9,179	6,521	--	--
Jack pine	309,368	188,635	66,944	29,848	9,309	14,145	487	--	--	--	--
White spruce	527,783	192,792	138,935	94,844	41,621	36,977	9,113	9,521	3,980	--	--
Black spruce	169,698	88,071	33,224	7,693	7,299	2,459	30,952	--	--	--	--
Balsam fir	323,226	173,148	94,749	38,721	11,249	5,359	--	--	--	--	--
Hemlock	661,391	88,478	106,868	136,176	123,441	63,695	48,533	43,326	47,014	3,349	511
Tamarack	66,942	42,336	13,472	7,749	2,881	504	--	--	--	--	--
Northern white-cedar	996,280	457,960	264,815	141,436	72,726	29,341	14,408	5,557	8,797	1,240	--
Other softwoods	1,602	1,602	--	--	--	--	--	--	--	--	--
Total	4,240,625	1,393,501	896,180	648,437	469,411	266,285	219,952	147,360	161,383	37,605	511
HARDWOODS											
Select white oaks	637	--	--	637	--	--	--	--	--	--	--
Select red oaks	65,731	--	16,213	16,541	13,615	9,089	5,165	3,594	1,514	--	--
Other red oaks	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	367,659	--	71,362	87,888	78,543	53,389	23,056	25,189	20,816	5,655	1,761
Hard maple	1,366,336	--	395,660	340,247	296,560	173,702	87,528	39,344	29,315	3,980	--
Soft maple	947,043	--	321,773	289,443	150,033	107,578	51,105	14,576	11,757	778	--
Beech	653,154	--	150,381	185,658	148,368	99,050	43,394	15,077	10,107	1,119	--
Ash	88,096	--	44,543	25,652	7,520	5,382	4,999	--	--	--	--
Balsam poplar	278,417	--	89,844	80,653	54,714	26,594	19,106	7,506	--	--	--
Cottonwood	1,936	--	--	1,256	680	--	--	--	--	--	--
Bigtooth aspen	112,159	--	46,675	37,594	12,593	12,827	2,470	--	--	--	--
Quaking aspen	638,290	--	342,525	178,261	71,035	26,876	13,384	5,538	671	--	--
Basswood	132,115	--	60,518	32,610	17,317	12,742	5,357	2,218	1,353	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--
Black cherry	91,220	--	61,971	20,211	6,347	1,342	925	424	--	--	--
Butternut	--	--	--	--	--	--	--	--	--	--	--
Elm	124,011	--	37,370	39,845	20,496	16,307	5,574	2,590	1,183	646	--
Paper birch	287,113	--	168,390	77,221	29,857	7,775	1,104	1,687	1,079	--	--
Other hardwoods	665	--	--	665	--	--	--	--	--	--	--
Total	5,154,582	--	1,807,225	1,414,382	907,678	552,653	263,167	117,743	77,795	12,178	1,761
All species	9,395,207	1,393,501	2,703,405	2,062,819	1,377,089	818,938	483,119	265,103	239,178	49,783	2,272

[1/] International 1/4-inch rule.

Table 32.--Net volume of growing stock on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Species group	All types	Forest type						
		Jack pine	Red pine	White pine	Balsam fir	White spruce	Black spruce	Northern white-cedar
SOFTWOODS								
White pine	146,073	5,190	6,978	47,948	9,410	2,713	11,558	20,113
Red pine	138,860	21,071	97,985	6,881	201	1,682	2,809	272
Jack pine	174,266	133,263	19,089	1,366	--	548	12,756	--
White spruce	148,642	348	1,256	2,316	55,842	17,403	1,103	15,883
Black spruce	170,997	6,202	1,130	3,121	8,382	727	99,164	35,907
Balsam fir	259,257	75	1,372	1,386	54,422	4,095	8,077	43,792
Hemlock	133,434	--	--	1,533	3,374	174	1,667	6,909
Tamarack	42,467	103	292	494	1,258	159	2,601	14,680
Northern white-cedar	532,848	136	226	1,176	23,537	6,179	7,165	393,045
Other softwoods	1,440	--	307	--	81	--	--	--
Total	1,748,284	166,388	128,635	66,221	156,507	33,680	146,900	530,601
HARDWOODS								
Select white oaks	358	--	--	--	--	--	--	--
Select red oaks	21,707	704	--	--	--	--	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	99,743	--	--	--	3,357	206	89	8,053
Hard maple	536,418	--	--	503	433	183	525	1,880
Soft maple	477,453	524	2,145	3,440	11,402	1,364	2,114	17,954
Beech	168,298	--	--	312	216	108	--	--
Ash	66,641	--	--	--	1,117	--	--	8,999
Balsam poplar	89,733	--	--	390	5,299	1,086	340	9,806
Cottonwood	368	--	--	--	--	--	--	--
Bigtooth aspen	66,570	1,108	2,078	738	474	--	1,896	882
Quaking aspen	363,836	1,404	888	3,268	20,893	3,603	16,375	11,631
Basswood	50,367	--	--	--	125	--	--	329
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	49,645	105	748	--	224	--	72	69
Butternut	--	--	--	--	--	--	--	--
Elm	41,158	--	--	--	930	118	--	955
Paper birch	253,926	515	1,005	4,344	15,347	1,503	6,117	48,873
Other hardwoods	239	--	--	--	--	--	--	--
Total	2,286,460	4,360	6,864	12,995	59,817	8,171	27,528	109,431
All species	4,034,744	170,748	135,499	79,216	216,324	41,851	174,428	640,032

(Table 32 continued on next page)

(Table 32 continued)

Species group	Forest type							
	Tamarack	Oak hickory	Elm-ash-soft maple	Maple-birch	Aspen	Paper birch	Exotic	Non-stocked
SOFTWOODS								
White pine	331	410	3,071	28,887	7,968	1,386	--	110
Red pine	223	342	83	1,013	5,083	741	262	212
Jack pine	--	26	--	741	6,176	--	--	301
White spruce	--	320	4,282	17,985	26,300	5,572	--	32
Black spruce	1,908	--	3,534	4,471	5,784	550	--	117
Balsam fir	625	85	15,243	54,892	66,182	8,817	--	194
Hemlock	--	--	8,865	105,796	3,511	1,605	--	--
Tamarack	17,014	--	2,820	127	2,555	129	--	235
Northern white-cedar	3,057	--	17,977	29,946	37,469	12,772	--	163
Other softwoods	--	--	--	--	--	--	1,052	--
Total	23,158	1,183	55,875	243,858	161,028	31,572	1,314	1,364
HARDWOODS								
Select white oaks	--	228	--	--	--	130	--	--
Select red oaks	--	12,074	371	5,682	2,153	723	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	--	--	8,724	77,392	1,362	560	--	--
Hard maple	--	115	2,758	516,576	9,792	3,653	--	--
Soft maple	--	1,995	65,318	330,226	31,007	9,931	--	33
Beech	--	--	543	166,892	227	--	--	--
Ash	--	--	27,520	21,372	5,530	2,103	--	--
Balsam poplar	273	--	3,481	5,410	60,817	2,649	--	182
Cottonwood	--	--	--	368	--	--	--	--
Bigtooth aspen	--	798	774	13,425	42,236	2,127	--	34
Quaking aspen	564	997	6,000	39,404	248,085	10,629	--	95
Basswood	--	377	441	47,170	1,925	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	--	77	561	46,094	1,695	--	--	--
Butternut	--	--	--	--	--	--	--	--
Elm	--	--	5,581	27,376	6,123	75	--	--
Paper birch	448	746	9,955	37,060	67,729	60,188	--	96
Other hardwoods	--	--	--	136	103	--	--	--
Total	1,285	17,407	132,027	1,334,583	478,784	92,768	--	440
All species	24,443	18,590	187,902	1,578,441	639,812	124,340	1,314	1,804

Table 33.--Net volume of sawtimber on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1/]

Species group	All types	Forest type: Jack pine	Red pine	White pine	Balsam fir	White spruce	Black spruce	Northern white-cedar
SOFTWOODS								
White pine	736,589	25,038	31,381	241,644	52,101	11,954	56,917	112,919
Red pine	447,746	71,538	292,196	32,559	622	7,345	12,792	1,534
Jack pine	309,368	224,063	33,609	1,386	--	2,012	33,293	--
White spruce	527,783	1,334	--	8,150	219,108	62,179	3,258	54,516
Black spruce	169,698	959	3,427	3,029	20,904	593	78,132	41,349
Balsam fir	323,226	--	2,538	1,865	48,856	8,902	18,272	37,082
Hemlock	661,391	--	--	7,534	16,343	1,049	8,161	38,913
Tamarack	66,942	--	839	1,876	4,904	--	1,154	22,598
Northern white-cedar	996,280	--	395	1,677	56,800	13,632	12,413	691,532
Other softwoods	1,602	--	690	--	--	--	--	--
Total	4,240,625	322,932	365,075	299,720	419,638	107,666	224,392	1,000,443
HARDWOODS								
Select white oaks	637	--	--	--	--	--	--	--
Select red oaks	65,731	600	--	--	--	--	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	367,659	--	--	--	13,893	674	--	24,509
Hard maple	1,366,336	--	--	1,929	--	--	1,033	5,498
Soft maple	947,043	--	--	2,891	15,236	--	2,771	24,232
Beech	653,154	--	--	--	--	634	--	--
Ash	88,096	--	--	--	623	--	--	8,291
Balsam poplar	278,417	--	--	681	15,730	1,468	300	29,187
Cottonwood	1,936	--	--	--	--	--	--	--
Bigtooth aspen	112,159	--	2,713	1,345	968	--	1,252	2,912
Quaking aspen	638,290	--	1,047	6,054	23,383	11,573	3,745	24,160
Basswood	132,115	--	--	--	695	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	91,220	--	608	--	--	--	--	--
Butternut	--	--	--	--	--	--	--	--
Elm	124,011	--	--	--	2,823	694	--	2,429
Paper birch	287,113	--	--	4,744	15,404	531	5,927	59,496
Other hardwoods	665	--	--	--	--	--	--	--
Total	5,154,582	600	4,368	17,644	88,755	15,574	15,028	180,714
All species	9,395,207	323,532	369,443	317,364	508,393	123,240	239,420	1,181,157

(Table 33 continued on next page)

[1/]International 1/4-inch rule.

(Table 33 continued)

Species group	Forest type							
	Tamarack	Oak hickory	Elm-ash-soft maple	Maple-birch	Aspen	Paper birch	Exotic	Non-stocked
SOFTWOODS								
White pine	1,310	1,800	15,957	145,947	33,349	5,657	--	615
Red pine	1,175	1,200	--	5,112	16,069	3,987	1,464	153
Jack pine	--	130	--	2,857	11,414	--	--	604
White spruce	--	807	15,722	64,130	83,088	15,333	--	158
Black spruce	554	--	8,217	10,040	1,977	--	--	517
Balsam fir	--	--	17,592	108,551	70,849	8,100	--	619
Hemlock	--	--	44,285	526,258	12,007	6,841	--	--
Tamarack	20,920	--	5,243	680	7,038	574	--	1,116
Northern white-cedar	5,871	--	48,249	82,230	62,513	20,567	--	401
Other softwoods	--	--	--	--	--	--	912	--
Total	29,830	3,937	155,265	945,805	298,304	61,059	2,376	4,183
HARDWOODS								
Select white oaks	--	637	--	--	--	--	--	--
Select red oaks	--	33,931	727	23,131	5,589	1,753	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	--	--	34,129	288,918	4,899	637	--	--
Hard maple	--	--	3,804	1,331,125	10,539	12,408	--	--
Soft maple	--	1,021	162,774	710,793	22,958	4,367	--	--
Beech	--	--	1,349	651,171	--	--	--	--
Ash	--	--	36,045	38,841	4,296	--	--	--
Balsam poplar	--	--	9,513	22,716	191,702	6,377	--	743
Cottonwood	--	--	--	1,936	--	--	--	--
Bigtooth aspen	--	2,059	3,606	41,057	52,345	3,902	--	--
Quaking aspen	--	665	14,528	111,458	416,283	25,394	--	--
Basswood	--	2,103	--	126,868	2,449	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	--	--	1,789	88,096	727	--	--	--
Butternut	--	--	--	--	--	--	--	--
Elm	--	--	13,790	94,972	9,303	--	--	--
Paper birch	--	--	16,008	65,720	55,491	63,792	--	--
Other hardwoods	--	--	--	665	--	--	--	--
Total	--	40,416	298,062	3,597,467	776,581	118,630	--	743
All species	29,830	44,353	453,327	4,543,272	1,074,885	179,689	2,376	4,926

Table 34.--Net volume of growing stock on commercial forest land by species group and ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Species group	All owners	Ownership class									
		National Forest	Bureau of Land Mgmt.	Misc. federal	Indian	State	County & municipal	Forest industry	Farmer	Misc. priv.-corp.	Misc. priv.-indiv.
SOFTWOODS											
White pine	146,073	29,163	--	420	--	52,417	102	28,355	7,351	11,267	16,998
Red pine	138,860	79,966	--	1,058	--	39,821	607	2,447	4,439	3,362	7,160
Jack pine	174,266	87,123	--	4,507	--	68,851	214	2,717	3,307	2,497	5,050
White spruce	148,642	56,757	--	732	--	28,119	104	13,578	12,191	12,615	24,546
Black spruce	170,997	64,693	--	--	149	49,661	--	21,908	6,955	10,507	17,124
Balsam fir	259,257	33,962	--	954	101	62,690	162	46,151	36,656	17,606	60,975
Hemlock	133,434	26,955	--	184	--	25,819	--	42,888	9,572	8,523	19,493
Tamarack	42,467	1,734	--	--	118	17,926	148	7,594	7,928	690	6,329
Northern white-cedar	532,848	47,514	--	242	244	154,891	1,047	116,320	72,257	42,891	97,442
Other softwoods	1,440	--	--	--	--	--	--	--	1,052	81	307
Total	1,748,284	427,867	--	8,097	612	500,195	2,384	281,958	161,708	110,039	255,424
HARDWOODS											
Select white oaks	358	--	--	--	--	109	--	--	--	130	119
Select red oaks	21,707	665	--	--	--	4,521	--	69	2,848	2,586	11,018
Other red oaks	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	99,743	25,200	--	1,241	--	16,108	299	26,539	8,103	5,490	16,763
Hard maple	536,418	103,156	--	379	2,588	68,908	513	125,779	94,286	23,961	116,848
Soft maple	477,453	112,998	--	505	95	101,468	1,426	107,301	41,022	24,878	87,760
Beech	168,298	37,164	--	--	--	15,488	--	74,302	5,982	9,111	26,251
Ash	66,641	2,515	--	95	259	12,415	--	10,413	14,207	3,187	23,550
Balsam poplar	89,733	3,094	--	--	237	14,658	--	14,197	21,059	5,652	30,836
Cottonwood	368	--	--	--	--	368	--	--	--	--	--
Bigtooth aspen	66,570	21,796	--	--	119	16,680	--	3,176	6,384	7,421	10,994
Quaking aspen	363,836	76,666	--	302	443	79,927	--	30,544	63,975	22,001	89,978
Basswood	50,367	5,291	--	--	349	6,911	--	6,528	9,850	2,708	18,730
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--
Black cherry	49,645	22,200	--	--	85	7,507	409	7,939	2,431	1,571	7,503
Butternut	--	--	--	--	--	--	--	--	--	--	--
Elm	41,158	12,076	--	--	626	8,658	--	3,364	11,058	574	4,802
Paper birch	253,926	44,787	--	1,521	526	81,030	--	24,949	32,705	17,265	51,143
Other hardwoods	239	--	--	--	--	--	--	136	--	--	103
Total	2,286,460	467,608	--	4,043	5,327	434,756	2,647	435,236	313,910	126,535	496,398
All species	4,034,744	895,475	--	12,140	5,939	934,951	5,031	717,194	475,618	236,574	751,822

Table 35.--Net volume of sawtimber on commercial forest land by species group and ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1/]

Species group	All owners	Ownership class: National Forest	Bureau of Land Mgmt.	Misc. federal	Indian	State	County & municipal	Forest industry	Farmer	Misc. priv.-corp.	Misc. priv.-indiv.
SOFTWOODS											
White pine	736,589	158,724	--	--	--	247,885	499	153,526	37,366	56,413	82,176
Red pine	447,746	199,420	--	5,931	--	167,035	--	9,126	16,475	16,165	33,594
Jack pine	309,368	133,077	--	11,250	--	136,092	--	4,697	7,943	7,933	8,376
White spruce	527,783	214,462	--	2,881	--	100,532	--	44,159	40,752	46,357	78,640
Black spruce	169,698	68,791	--	--	--	47,670	--	21,411	7,193	10,383	14,250
Balsam fir	323,226	39,990	--	2,749	428	86,224	--	56,684	36,694	22,935	77,522
Hemlock	661,391	144,781	--	1,062	--	124,331	--	215,966	41,082	44,382	89,787
Tamarack	66,942	4,159	--	--	--	30,410	--	11,617	13,207	1,401	6,148
Northern white-cedar	996,280	57,460	--	409	409	314,945	392	237,619	118,170	89,310	177,566
Other softwoods	1,602	--	--	--	--	--	--	--	912	--	690
Total	4,240,625	1,020,864	--	24,282	837	1,255,124	891	754,805	319,794	295,279	568,749
HARDWOODS											
Select white oaks	637	--	--	--	--	--	--	--	--	--	637
Select red oaks	65,731	--	--	--	--	15,098	--	--	11,997	5,747	32,889
Other red oaks	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	367,659	94,953	--	3,996	--	59,872	1,389	109,457	21,784	17,161	59,047
Hard maple	1,366,336	209,764	--	1,527	2,880	169,150	--	458,510	218,895	62,426	243,184
Soft maple	947,043	170,640	--	--	--	188,002	4,302	267,517	66,779	42,235	207,568
Beech	653,154	137,283	--	--	--	58,330	--	307,739	24,640	34,175	90,987
Ash	88,096	--	--	--	--	11,305	--	19,640	15,956	4,473	36,722
Balsam poplar	278,417	14,542	--	--	1,295	38,033	--	46,831	64,594	17,161	95,961
Cottonwood	1,936	--	--	--	--	1,936	--	--	--	--	--
Bigtooth aspen	112,159	30,136	--	--	644	26,121	--	3,354	13,710	5,853	32,341
Quaking aspen	638,290	111,531	--	--	648	149,228	--	42,841	119,314	46,794	167,934
Basswood	132,115	10,280	--	--	1,920	17,107	--	19,156	25,516	9,704	48,432
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--
Black cherry	91,220	48,383	--	--	--	7,494	587	13,919	7,423	4,132	9,282
Butternut	--	--	--	--	--	--	--	--	--	--	--
Elm	124,011	38,731	--	--	2,383	25,506	--	8,931	33,306	1,392	13,762
Paper birch	287,113	36,466	--	1,175	--	91,547	--	24,586	42,925	14,197	76,217
Other hardwoods	665	--	--	--	--	--	--	665	--	--	--
Total	5,154,582	902,709	--	6,698	9,770	858,729	6,278	1,323,146	666,839	265,450	1,114,963
All species	9,395,207	1,923,573	--	30,980	10,607	2,113,853	7,169	2,077,951	986,633	560,729	1,683,712

[1/]International 1/4-inch rule.

Table 36.--Net volume of growing stock on commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Forest type	All classes	Stand-age class (years)												
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-140	141+
Jack pine	170,748	5,582	3,684	8,477	39,153	64,671	23,821	15,383	6,152	3,825	--	--	--	--
Red pine	135,499	1,421	4,669	33,793	49,207	15,350	4,031	5,131	10,246	1,010	2,366	8,275	--	--
White pine	79,216	823	1,447	2,769	1,961	4,769	6,604	19,509	10,142	3,568	3,380	9,818	7,202	7,224
Balsam fir	216,324	11,288	10,554	3,790	34,559	87,039	33,358	12,021	6,784	2,110	4,062	8,217	2,542	--
White spruce	41,851	221	1,806	550	--	11,456	5,935	5,532	5,357	7,516	--	3,478	--	--
Black spruce	174,428	10,814	11,953	39,113	49,565	18,162	17,278	9,671	8,087	3,067	4,281	1,107	--	1,330
Northern white-cedar	640,032	3,550	13,251	25,312	33,021	31,507	61,366	81,162	70,325	71,886	64,135	83,812	54,712	45,993
Tamarack	24,443	362	2,240	1,747	903	1,133	5,000	5,172	3,433	1,686	1,746	1,021	--	--
Oak-hickory	18,590	--	998	--	384	3,193	7,145	2,054	--	938	2,083	--	1,795	--
Elm-ash-soft maple	187,902	6,940	8,233	7,645	6,927	20,343	36,036	14,622	11,656	12,939	18,807	30,276	10,045	3,433
Maple-birch	1,578,441	30,029	34,359	39,980	89,973	264,905	199,010	178,574	105,886	138,692	142,181	198,421	111,011	45,420
Aspen	639,812	42,361	23,316	10,850	140,317	154,188	117,501	70,704	20,173	16,019	31,558	12,825	--	--
Paper birch	124,340	7,162	3,850	826	3,462	19,377	37,662	34,192	8,378	--	4,076	5,355	--	--
Exotic	1,314	--	--	1,314	--	--	--	--	--	--	--	--	--	--
Nonstocked	1,804	403	195	--	179	352	474	--	--	201	--	--	--	--
All types	4,034,744	120,956	120,555	176,166	449,611	696,445	555,221	453,727	266,619	263,457	278,675	362,605	187,307	103,400

Table 37.--Net volume of sawtimber on commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1/]

Forest type	All classes	Stand-age lass (years)												
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-140	141+
Jack pine	323,532	10,790	11,482	9,016	73,360	92,596	45,212	44,892	22,413	13,771	--	--	--	--
Red pine	369,443	896	11,813	46,423	128,033	48,709	18,787	20,105	48,945	5,389	10,695	29,648	--	--
White pine	317,364	2,493	7,278	6,652	5,986	11,154	20,462	88,869	37,387	17,699	16,426	41,741	27,665	33,552
Balsam fir	508,393	28,452	23,127	2,531	50,656	258,310	58,894	15,560	16,351	8,809	11,830	24,660	9,213	--
White spruce	123,240	650	6,264	--	--	29,982	12,293	19,851	12,325	26,079	--	15,796	--	--
Black spruce	239,420	13,377	20,493	86,957	34,914	18,883	25,456	11,022	10,319	--	12,620	--	--	5,379
Northern white-cedar	1,181,157	8,281	18,275	19,849	34,596	45,355	79,506	99,889	95,869	131,914	138,287	202,698	156,136	150,502
Tamarack	29,830	1,175	1,468	2,392	1,014	496	4,908	5,241	6,163	962	3,682	2,329	--	--
Oak-hickory	44,353	--	691	--	130	3,641	15,230	9,717	--	973	6,718	--	7,253	--
Elm-ash-soft maple	453,327	9,371	11,748	10,038	6,529	30,120	74,390	23,953	32,347	46,995	58,102	104,392	32,157	13,185
Maple-birch	4,543,272	86,250	87,673	87,967	177,206	513,915	423,362	480,615	308,735	488,380	514,434	718,446	488,711	167,578
Aspen	1,074,885	57,295	30,385	13,992	184,481	215,280	177,094	139,638	58,383	53,346	101,935	43,056	--	--
Paper birch	179,689	11,475	8,061	--	1,636	28,611	47,481	37,246	16,110	--	12,267	16,802	--	--
Exotic	2,376	--	--	2,376	--	--	--	--	--	--	--	--	--	--
Nonstocked	4,926	379	568	--	--	1,633	1,763	--	--	583	--	--	--	--
All types	9,395,207	230,884	239,326	288,193	698,541	1,298,685	1,004,838	996,598	665,347	794,900	886,996	1,199,568	721,135	370,196

[1/]International 1/4-inch rule.

Table 38.--Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Forest type and stand-size class	All classes	Basal-area class (square feet per acre)						
		0-10	11-20	21-30	31-40	41-50	51-60	61-70
Jack pine								
Sawtimber	36,972	--	--	--	611	5,674	3,399	6,650
Poletimber	130,267	--	188	3,885	5,389	8,154	7,201	5,556
Sapling & seedling	3,509	271	1,124	261	1,633	--	--	--
All stands	170,748	271	1,312	4,146	7,633	13,828	10,600	12,206
Red pine								
Sawtimber	55,884	--	619	--	1,010	731	1,378	2,013
Poletimber	76,698	--	--	--	--	1,629	1,205	1,548
Sapling & seedling	2,917	--	234	1,173	1,142	--	368	--
All stands	135,499	--	853	1,173	2,152	2,360	2,951	3,561
White pine								
Sawtimber	62,126	--	--	583	789	675	2,414	659
Poletimber	13,983	--	--	--	--	2,990	964	1,101
Sapling & seedling	3,107	283	765	--	846	--	--	1,213
All stands	79,216	283	765	583	1,635	3,665	3,378	2,973
Balsam fir								
Sawtimber	77,149	--	--	--	--	--	840	--
Poletimber	112,620	--	--	--	601	2,544	--	2,115
Sapling & seedling	26,555	52	222	2,229	3,640	4,534	3,163	4,731
All stands	216,324	52	222	2,229	4,241	7,078	4,003	6,846
White spruce								
Sawtimber	21,862	--	--	--	589	--	--	--
Poletimber	17,413	--	--	--	--	--	--	--
Sapling & seedling	2,576	--	643	--	411	--	--	1,522
All stands	41,851	--	643	--	1,000	--	--	1,522
Black spruce								
Sawtimber	6,307	--	--	--	--	--	1,330	--
Poletimber	131,753	174	--	--	27,014	2,599	3,667	5,618
Sapling & seedling	36,368	220	5,641	495	2,586	4,839	3,957	5,758
All stands	174,428	394	5,641	495	29,600	7,438	8,954	11,376
Northern white-cedar								
Sawtimber	202,542	--	--	--	2,403	715	2,132	2,287
Poletimber	376,681	--	--	--	935	944	478	2,320
Sapling & seedling	60,809	--	137	594	1,345	2,535	2,266	5,323
All stands	640,032	--	137	594	4,683	4,194	4,876	9,930

(Table 38 continued on next page)

(Table 38 continued)

Forest type and stand-size class	Basal-area class (square feet per acre)						
	71-80	81-90	91-100	101-120	121-150	151-180	181+
Jack pine							
Sawtimber	5,873	2,433	2,727	9,605	--	--	--
Poletimber	12,536	7,370	31,325	34,017	14,646	--	--
Sapling & seedling	220	--	--	--	--	--	--
All stands	18,629	9,803	34,052	43,622	14,646	--	--
Red pine							
Sawtimber	8,347	--	8,753	10,228	16,827	1,763	4,215
Poletimber	16,833	--	--	26,880	2,659	13,271	12,673
Sapling & seedling	--	--	--	--	--	--	--
All stands	25,180	--	8,753	37,108	19,486	15,034	16,888
White pine							
Sawtimber	13,400	1,516	9,155	25,395	2,917	4,623	--
Poletimber	--	--	--	8,928	--	--	--
Sapling & seedling	--	--	--	--	--	--	--
All stands	13,400	1,516	9,155	34,323	2,917	4,623	--
Balsam fir							
Sawtimber	--	3,297	4,856	55,453	6,531	--	6,172
Poletimber	16,500	8,567	20,908	19,694	18,962	9,833	12,896
Sapling & seedling	2,673	2,628	1,293	469	921	--	--
All stands	19,173	14,492	27,057	75,616	26,414	9,833	19,068
White spruce							
Sawtimber	--	--	--	1,968	4,059	6,256	8,990
Poletimber	--	--	5,077	1,902	7,275	--	3,159
Sapling & seedling	--	--	--	--	--	--	--
All stands	--	--	5,077	3,870	11,334	6,256	12,149
Black spruce							
Sawtimber	1,830	1,529	--	1,618	--	--	--
Poletimber	6,734	3,542	14,360	56,310	9,280	2,455	--
Sapling & seedling	3,050	2,398	3,402	3,023	999	--	--
All stands	11,614	7,469	17,762	60,951	10,279	2,455	--
Northern white-cedar							
Sawtimber	5,632	--	2,991	40,994	36,507	51,666	57,215
Poletimber	4,177	7,783	14,903	39,851	92,363	92,865	120,062
Sapling & seedling	5,532	2,529	3,079	10,149	14,730	11,613	977
All stands	15,341	10,312	20,973	90,994	143,600	156,144	178,254

(Table 38 continued on next page)

(Table 38 continued)

Forest type and stand-size class	All classes	Basal-area class (square feet per acre) 0-10	11-20	21-30	31-40	41-50	51-60	61-70
Tamarack								
Sawtimber	1,021	--	--	--	--	--	--	--
Poletimber	17,247	--	--	--	824	2,559	1,612	4,565
Sapling & seedling	6,175	87	72	290	1,018	218	1,232	--
All stands	24,443	87	72	290	1,842	2,777	2,844	4,565
Oak-hickory								
Sawtimber	5,933	--	--	--	924	--	--	1,130
Poletimber	11,659	--	--	--	--	--	938	4,349
Sapling & seedling	998	--	--	--	--	--	--	998
All stands	18,590	--	--	--	924	--	938	6,477
Elm-ash-soft maple								
Sawtimber	82,811	--	--	--	--	2,183	976	1,019
Poletimber	80,888	--	--	--	885	2,501	2,025	5,515
Sapling & seedling	24,203	121	475	1,232	1,197	1,555	3,318	5,138
All stands	187,902	121	475	1,232	2,082	6,239	6,319	11,672
Maple-birch								
Sawtimber	817,471	--	397	--	2,737	1,925	1,397	21,224
Poletimber	683,648	--	356	618	3,664	4,676	3,752	14,389
Sapling & seedling	77,322	171	78	879	3,893	12,297	6,664	17,226
All stands	1,578,441	171	831	1,497	10,294	18,898	11,813	52,839
Aspen								
Sawtimber	126,853	--	--	692	986	13,978	1,108	5,793
Poletimber	447,962	--	1,094	756	3,374	5,904	7,724	20,845
Sapling & seedling	64,997	732	4,185	11,600	8,094	14,065	9,255	2,634
All stands	639,812	732	5,279	13,048	12,454	33,947	18,087	29,272
Paper birch								
Sawtimber	15,636	--	--	--	--	--	--	3,305
Poletimber	101,184	--	--	--	--	4,217	4,886	3,948
Sapling & seedling	7,520	129	--	444	856	2,479	--	1,328
All stands	124,340	129	--	444	856	6,696	4,886	8,581
Exotic								
Sawtimber	--	--	--	--	--	--	--	--
Poletimber	1,314	--	--	--	--	--	--	--
Sapling & seedling	--	--	--	--	--	--	--	--
All stands	1,314	--	--	--	--	--	--	--
Nonstocked	1,804	437	1,222	34	27	--	--	--
All types								
Sawtimber	1,512,567	--	1,016	1,275	10,049	25,881	14,974	44,080
Poletimber	2,203,317	174	1,638	5,259	42,686	38,717	34,452	71,869
Sapling & seedling	317,056	2,066	13,576	19,197	26,661	42,522	30,223	45,871
Nonstocked	1,804	437	1,222	34	27	--	--	--
All stands	4,034,744	2,677	17,452	25,765	79,423	107,120	79,649	161,820

(Table 38 continued on next page)

(Table 38 continued)

Forest type and stand-size class	Basal-area class (square feet per acre)						
	71-80	81-90	91-100	101-120	121-150	151-180	181+
Tamarack							
Sawtimber	1,021	--	--	--	--	--	--
Poletimber	1,338	3,291	3,058	--	--	--	--
Sapling & seedling	1,029	855	384	--	990	--	--
All stands	3,388	4,146	3,442	--	990	--	--
Oak-hickory							
Sawtimber	1,796	--	--	2,083	--	--	--
Poletimber	1,833	1,879	777	1,883	--	--	--
Sapling & seedling	--	--	--	--	--	--	--
All stands	3,629	1,879	777	3,966	--	--	--
Elm-ash-soft maple							
Sawtimber	10,918	--	790	13,500	26,382	22,869	4,174
Poletimber	3,545	1,396	15,956	7,426	31,505	10,134	--
Sapling & seedling	2,085	1,680	3,640	1,477	2,285	--	--
All stands	16,548	3,076	20,386	22,403	60,172	33,003	4,174
Maple-birch							
Sawtimber	61,181	56,431	102,504	199,409	215,903	94,211	60,152
Poletimber	33,029	49,313	95,352	145,598	239,383	86,548	6,970
Sapling & seedling	13,809	11,367	3,066	6,893	979	--	--
All stands	108,019	117,111	200,922	351,900	456,265	180,759	67,122
Aspen							
Sawtimber	8,921	6,610	12,131	4,188	37,914	16,063	18,469
Poletimber	17,996	50,261	68,769	55,965	82,200	107,147	25,927
Sapling & seedling	6,612	2,893	2,393	1,430	1,104	--	--
All stands	33,529	59,764	83,293	61,583	121,218	123,210	44,396
Paper birch							
Sawtimber	--	--	--	2,234	10,097	--	--
Poletimber	6,102	--	32,108	19,672	15,501	6,449	8,301
Sapling & seedling	629	1,116	539	--	--	--	--
All stands	6,731	1,116	32,647	21,906	25,598	6,449	8,301
Exotic							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	1,314	--	--	--
Sapling & seedling	--	--	--	--	--	--	--
All stands	--	--	--	1,314	--	--	--
Nonstocked	84	--	--	--	--	--	--
All types							
Sawtimber	118,919	71,816	143,907	366,675	357,137	197,451	159,387
Poletimber	120,623	133,402	302,593	419,440	513,774	328,702	189,988
Sapling & seedling	35,639	25,466	17,796	23,441	22,008	11,613	977
Nonstocked	84	--	--	--	--	--	--
All stands	275,265	230,684	464,296	809,556	892,919	537,766	350,352

Table 39.--Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1/]

Forest type and stand-size class	All classes	Basal-area class (square feet per acre) 0-10	11-20	21-30	31-40	41-50	51-60	61-70
Jack pine								
Sawtimber	127,742	--	--	--	1,583	19,657	13,192	21,963
Poletimber	183,203	--	--	9,000	10,627	11,601	14,229	10,111
Sapling & seedling	12,587	813	4,390	458	5,877	--	--	--
All stands	323,532	813	4,390	9,458	18,087	31,258	27,421	32,074
Red pine								
Sawtimber	240,588	--	3,362	--	5,389	2,572	6,944	9,768
Poletimber	123,908	--	--	--	--	2,403	2,251	2,123
Sapling & seedling	4,947	--	--	4,257	--	--	690	--
All stands	369,443	--	3,362	4,257	5,389	4,975	9,885	11,891
White pine								
Sawtimber	270,749	--	--	2,609	2,398	2,704	9,674	2,580
Poletimber	34,359	--	--	--	--	8,808	2,081	2,475
Sapling & seedling	12,256	1,545	4,020	--	4,205	--	--	2,486
All stands	317,364	1,545	4,020	2,609	6,603	11,512	11,755	7,541
Balsam fir								
Sawtimber	275,169	--	--	--	--	--	2,493	--
Poletimber	179,115	--	--	--	1,418	2,434	--	962
Sapling & seedling	54,109	--	695	7,797	7,507	11,882	6,850	8,696
All stands	508,393	--	695	7,797	8,925	14,316	9,343	9,658
White spruce								
Sawtimber	77,712	--	--	--	2,163	--	--	--
Poletimber	38,614	--	--	--	--	--	--	--
Sapling & seedling	6,914	--	1,278	--	1,466	--	--	4,170
All stands	123,240	--	1,278	--	3,629	--	--	4,170
Black spruce								
Sawtimber	21,624	--	--	--	--	--	5,380	--
Poletimber	168,689	--	--	--	71,955	3,143	3,622	3,373
Sapling & seedling	49,107	1,255	7,552	--	3,563	5,751	3,413	9,134
All stands	239,420	1,255	7,552	--	75,518	8,894	12,415	12,507
Northern white-cedar								
Sawtimber	661,791	--	--	--	10,196	1,876	9,451	7,170
Poletimber	455,364	--	--	--	1,856	1,357	--	2,875
Sapling & seedling	64,002	--	--	1,525	1,850	4,121	3,557	7,125
All stands	1,181,157	--	--	1,525	13,902	7,354	13,008	17,170

(Table 39 continued on next page)

(Table 39 continued)

Forest type and stand-size class	Basal-area class (square feet per acre)						
	71-80	81-90	91-100	101-120	121-150	151-180	181+
Jack pine							
Sawtimber	20,406	9,432	9,709	31,800	--	--	--
Poletimber	23,957	11,651	56,364	14,070	21,593	--	--
Sapling & seedling	1,049	--	--	--	--	--	--
All stands	45,412	21,083	66,073	45,870	21,593	--	--
Red pine							
Sawtimber	43,133	--	39,208	46,708	63,982	4,429	15,093
Poletimber	35,986	--	--	37,494	2,548	37,584	3,519
Sapling & seedling	--	--	--	--	--	--	--
All stands	79,119	--	39,208	84,202	66,530	42,013	18,612
White pine							
Sawtimber	56,431	7,991	36,033	119,166	9,642	21,521	--
Poletimber	--	--	--	20,995	--	--	--
Sapling & seedling	--	--	--	--	--	--	--
All stands	56,431	7,991	36,033	140,161	9,642	21,521	--
Balsam fir							
Sawtimber	--	11,246	14,733	205,909	20,149	--	20,639
Poletimber	24,637	13,508	30,751	34,394	28,674	21,031	21,306
Sapling & seedling	3,574	5,989	402	717	--	--	--
All stands	28,211	30,743	45,886	241,020	48,823	21,031	41,945
White spruce							
Sawtimber	--	--	--	5,711	17,892	23,909	28,037
Poletimber	--	--	11,374	4,399	16,653	--	6,188
Sapling & seedling	--	--	--	--	--	--	--
All stands	--	--	11,374	10,110	34,545	23,909	34,225
Black spruce							
Sawtimber	6,303	4,931	--	5,010	--	--	--
Poletimber	12,456	555	19,997	39,957	8,580	5,051	--
Sapling & seedling	2,898	5,828	5,663	1,819	2,231	--	--
All stands	21,657	11,314	25,660	46,786	10,811	5,051	--
Northern white-cedar							
Sawtimber	19,738	--	11,103	134,383	119,560	154,242	194,072
Poletimber	5,586	9,297	20,388	55,113	121,722	118,753	118,417
Sapling & seedling	4,337	4,589	1,349	16,447	10,380	7,437	1,285
All stands	29,661	13,886	32,840	205,943	251,662	280,432	313,774

(Table 39 continued on next page)

(Table 39 continued)

Forest type and stand-size class	All classes	Basal-area class (square feet per acre) 0-10	11-20	21-30	31-40	41-50	51-60	61-70
Tamarack								
Sawtimber	2,330	--	--	--	--	--	--	--
Poletimber	21,452	--	--	--	603	2,366	2,989	5,140
Sapling & seedling	6,048	--	--	1,175	1,014	--	2,549	--
All stands	29,830	--	--	1,175	1,617	2,366	5,538	5,140
Oak-hickory								
Sawtimber	23,688	--	--	--	5,113	--	--	4,604
Poletimber	19,974	--	--	--	--	--	973	7,035
Sapling & seedling	691	--	--	--	--	--	--	691
All stands	44,353	--	--	--	5,113	--	973	12,330
Elm-ash-soft maple								
Sawtimber	280,107	--	--	--	--	8,110	3,757	3,102
Poletimber	142,063	--	--	--	435	5,063	4,974	7,871
Sapling & seedling	31,157	--	1,567	2,688	1,496	1,222	3,624	5,745
All stands	453,327	--	1,567	2,688	1,931	14,395	12,355	16,718
Maple-birch								
Sawtimber	3,033,029	--	1,128	--	12,364	7,895	5,948	80,371
Poletimber	1,303,501	--	555	373	3,461	7,725	6,881	24,678
Sapling & seedling	206,742	476	--	706	8,637	36,668	16,056	44,934
All stands	4,543,272	476	1,683	1,079	24,462	52,288	28,885	149,983
Aspen								
Sawtimber	435,807	--	--	1,849	4,893	63,717	3,643	19,303
Poletimber	551,552	--	698	468	2,803	6,664	4,135	30,620
Sapling & seedling	87,526	1,923	8,363	8,856	10,727	24,436	10,685	6,428
All stands	1,074,885	1,923	9,061	11,173	18,423	94,817	18,463	56,351
Paper birch								
Sawtimber	43,323	--	--	--	--	--	--	9,276
Poletimber	124,011	--	--	--	--	6,933	7,182	3,774
Sapling & seedling	12,355	574	--	1,165	--	6,405	--	2,425
All stands	179,689	574	--	1,165	--	13,338	7,182	15,475
Exotic								
Sawtimber	--	--	--	--	--	--	--	--
Poletimber	2,376	--	--	--	--	--	--	--
Sapling & seedling	--	--	--	--	--	--	--	--
All stands	2,376	--	--	--	--	--	--	--
Nonstocked	4,926	158	4,548	--	--	--	--	--
All types								
Sawtimber	5,493,659	--	4,490	4,458	44,099	106,531	60,482	158,137
Poletimber	3,348,181	--	1,253	9,841	93,158	58,497	49,317	101,037
Sapling & seedling	548,441	6,586	27,865	28,627	46,342	90,485	47,424	91,834
Nonstocked	4,926	158	4,548	--	--	--	--	--
All stands	9,395,207	6,744	38,156	42,926	183,599	255,513	157,223	351,008

(Table 39 continued on next page)

(Table 39 continued)

Forest type and stand-size class	Basal-area class (square feet per acre)						
	71-80	81-90	91-100	101-120	121-150	151-180	181+
Tamarack							
Sawtimber	2,330	--	--	--	--	--	--
Poletimber	2,542	4,638	3,174	--	--	--	--
Sapling & seedling	--	--	--	--	1,310	--	--
All stands	4,872	4,638	3,174	--	1,310	--	--
Oak-hickory							
Sawtimber	7,253	--	--	6,718	--	--	--
Poletimber	4,526	3,949	559	2,932	--	--	--
Sapling & seedling	--	--	--	--	--	--	--
All stands	11,779	3,949	559	9,650	--	--	--
Elm-ash-soft maple							
Sawtimber	41,392	--	2,425	41,899	87,943	74,154	17,325
Poletimber	7,576	--	29,290	11,995	64,506	10,353	--
Sapling & seedling	3,601	1,246	6,619	--	3,349	--	--
All stands	52,569	1,246	38,334	53,894	155,798	84,507	17,325
Maple-birch							
Sawtimber	239,022	212,675	396,956	736,255	786,032	318,214	236,169
Poletimber	70,245	114,039	178,535	220,289	460,146	202,402	14,172
Sapling & seedling	40,693	20,588	10,484	25,635	1,865	--	--
All stands	349,960	347,302	585,975	982,179	1,248,043	520,616	250,341
Aspen							
Sawtimber	33,226	21,797	38,743	17,322	125,378	50,720	55,216
Poletimber	21,783	73,006	97,685	80,199	107,037	94,919	31,535
Sapling & seedling	7,290	4,006	2,211	2,601	--	--	--
All stands	62,299	98,809	138,639	100,122	232,415	145,639	86,751
Paper birch							
Sawtimber	--	--	--	6,799	27,248	--	--
Poletimber	7,738	--	33,714	20,186	25,133	12,114	7,237
Sapling & seedling	--	1,786	--	--	--	--	--
All stands	7,738	1,786	33,714	26,985	52,381	12,114	7,237
Exotic							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	2,376	--	--	--
Sapling & seedling	--	--	--	--	--	--	--
All stands	--	--	--	2,376	--	--	--
Nonstocked	220	--	--	--	--	--	--
All types							
Sawtimber	469,234	268,072	548,910	1,357,680	1,257,826	647,189	566,551
Poletimber	217,032	230,643	481,831	544,399	856,592	502,207	202,374
Sapling & seedling	63,442	44,032	26,728	47,219	19,135	7,437	1,285
Nonstocked	220	--	--	--	--	--	--
All stands	749,928	542,747	1,057,469	1,949,298	2,133,553	1,156,833	770,210

1/ International 1/4-inch rule.

Table 40.--Net volume of sawtimber on commercial forest land by species group and log-grade, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1/]

Species group	All grades	Log grade			
		1	2	3	Tie and timber
SOFTWOODS					
White pine	736,589	70,428	92,808	438,261	135,092
Red pine	447,746	19,086	11,467	400,081	17,112
Jack pine	309,368	--	3,566	305,780	22
White spruce	527,783	--	11,389	516,394	--
Black spruce	169,698	34	115	169,549	--
Balsam fir	323,226	--	--	313,529	9,697
Hemlock	661,391	10,360	46,105	577,252	27,674
Tamarack	66,942	737	2,615	63,590	--
Northern white-cedar	996,280	11,088	16,383	968,809	--
Other softwoods	1,602	--	--	1,602	--
Total	4,240,625	111,733	184,448	3,754,847	189,597
HARDWOODS					
Select white oaks	637	--	278	300	59
Select red oaks	65,731	--	30,399	30,491	4,841
Other red oaks	--	--	--	--	--
Hickory	--	--	--	--	--
Yellow birch	367,659	31,523	130,329	160,526	45,281
Hard maple	1,366,336	111,798	438,140	717,466	98,932
Soft maple	947,043	61,529	200,089	592,249	93,176
Beech	653,154	24,710	118,705	453,626	56,113
Ash	88,096	11,934	19,422	39,173	17,567
Balsam poplar	278,417	3,473	28,509	227,251	19,184
Cottonwood	1,936	10	483	1,285	158
Bigtooth aspen	112,159	701	38,598	65,884	6,976
Quaking aspen	638,290	6,737	109,576	437,033	84,944
Basswood	132,115	--	36,211	92,918	2,986
Yellow-poplar	--	--	--	--	--
Black walnut	--	--	--	--	--
Black cherry	91,220	--	634	82,630	7,956
Butternut	--	--	--	--	--
Elm	124,011	12,939	57,247	33,150	20,675
Paper birch	287,113	12,526	54,313	197,770	22,504
Other hardwoods	665	--	--	618	47
Total	5,154,582	277,880	1,262,933	3,132,370	481,399
All species	9,395,207	389,613	1,447,381	6,887,217	670,996

[1/]International 1/4-inch rule.

Table 41.--Net volume of short-log trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Species group	All classes	Diameter class (inches at breast height) 9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39-0+
SOFTWOODS											
White pine	1,458	455	409	273	153	--	71	--	97	--	--
Red pine	110	110	--	--	--	--	--	--	--	--	--
Jack pine	1,004	784	83	61	76	--	--	--	--	--	--
White spruce	435	106	74	--	--	160	95	--	--	--	--
Black spruce	360	284	76	--	--	--	--	--	--	--	--
Balsam fir	1,322	469	636	130	--	87	--	--	--	--	--
Hemlock	2,884	628	575	514	315	230	361	90	171	--	--
Tamarack	123	123	--	--	--	--	--	--	--	--	--
Northern white-cedar	9,100	2,502	2,005	1,780	769	582	828	152	358	124	--
Other softwoods	--	--	--	--	--	--	--	--	--	--	--
Total	16,796	5,461	3,858	2,758	1,313	1,059	1,355	242	626	124	--
HARDWOODS											--
Select white oaks	--	--	--	--	--	--	--	--	--	--	--
Select red oaks	811	--	172	94	95	--	--	334	116	--	--
Other red oaks	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	5,090	--	1,136	849	688	810	486	193	479	449	--
Hard maple	11,404	--	4,832	2,195	1,303	1,307	657	208	542	360	--
Soft maple	7,212	--	2,112	1,390	1,973	852	85	512	288	--	--
Beech	6,340	--	1,386	1,365	727	803	772	497	790	--	--
Ash	1,317	--	706	319	202	90	--	--	--	--	--
Balsam poplar	834	--	444	129	--	94	167	--	--	--	--
Cottonwood	--	--	--	--	--	--	--	--	--	--	--
Bigtooth aspen	482	--	79	--	226	93	--	84	--	--	--
Quaking aspen	4,210	--	1,794	1,587	561	175	--	93	--	--	--
Basswood	829	--	251	291	192	--	--	95	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--
Black cherry	602	--	225	227	76	74	--	--	--	--	--
Butternut	--	--	--	--	--	--	--	--	--	--	--
Elm	105	--	--	--	--	105	--	--	--	--	--
Paper birch	2,365	--	917	649	317	157	238	--	87	--	--
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--
Total	41,601	--	14,054	9,095	6,360	4,560	2,405	2,016	2,302	809	--
All species	58,397	5,461	17,912	11,853	7,673	5,619	3,760	2,258	2,928	933	--

Table 42.--Net volume of short-log trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1/]

Species group	All classes	Diameter class (inches at breast height) 9.0 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 28.9	29.0- 38.9	39-0+
SOFTWOODS											
White pine	5,438	1,961	1,424	950	506	--	349	--	248	--	--
Red pine	468	468	--	--	--	--	--	--	--	--	--
Jack pine	4,019	3,415	312	39	253	--	--	--	--	--	--
White spruce	1,472	425	289	--	--	481	277	--	--	--	--
Black spruce	1,590	1,177	413	--	--	--	--	--	--	--	--
Balsam fir	5,184	1,886	2,579	454	--	265	--	--	--	--	--
Hemlock	10,779	2,821	2,442	1,798	933	689	1,326	243	527	--	--
Tamarack	505	505	--	--	--	--	--	--	--	--	--
Northern white-cedar	28,923	11,369	7,354	5,159	1,861	1,073	1,345	236	422	104	--
Other softwoods	--	--	--	--	--	--	--	--	--	--	--
Total	58,378	24,027	14,813	8,400	3,553	2,508	3,297	479	1,197	104	--
HARDWOODS											
Select white oaks	--	--	--	--	--	--	--	--	--	--	--
Select red oaks	2,279	--	419	249	268	--	--	997	346	--	--
Other red oaks	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	24,611	--	7,867	4,838	3,119	3,450	1,915	652	1,474	1,296	--
Hard maple	29,647	--	12,988	6,516	3,852	3,147	1,472	424	951	297	--
Soft maple	22,482	--	6,487	4,252	6,384	2,670	279	1,526	884	--	--
Beech	17,511	--	3,259	3,401	1,912	2,446	2,346	1,646	2,501	--	--
Ash	3,386	--	1,732	830	563	261	--	--	--	--	--
Balsam poplar	2,111	--	1,127	197	--	272	515	--	--	--	--
Cottonwood	--	--	--	--	--	--	--	--	--	--	--
Bigtooth aspen	1,142	--	232	--	498	235	--	177	--	--	--
Quaking aspen	11,399	--	5,119	4,334	1,341	419	--	186	--	--	--
Basswood	2,219	--	628	763	539	--	--	289	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--
Black cherry	1,956	--	542	898	244	272	--	--	--	--	--
Butternut	--	--	--	--	--	--	--	--	--	--	--
Elm	296	--	--	--	--	296	--	--	--	--	--
Paper birch	6,793	--	2,156	1,815	953	531	934	--	404	--	--
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--
Total	125,832	--	42,556	28,093	19,673	13,999	7,461	5,897	6,560	1,593	--
All species	184,210	24,027	57,369	36,493	23,226	16,507	10,758	6,376	7,757	1,697	--

[1/]International 1/4-inch rule.

Table 43.--Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1965 and 1979

(In million cubic feet)

Species	1965	1979
Softwoods	40.6	59.5
Hardwoods	60.6	72.7
All species	101.2	132.2

1/Figures have been adjusted from those published after the 1965 survey to conform to 1979 volumes because of changes in survey definitions and procedures.

Table 44.--Net annual growth of growing stock on commercial forest land by species group and county, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

Species group	All counties	County						
		Alger	Chippewa	Delta	Luce	Mackinac	Menominee	Schoolcraft
SOFTWOODS								
White pine	4,426	578	501	387	967	400	701	892
Red pine	6,437	974	1,428	1,253	768	824	134	1,056
Jack pine	7,527	475	2,875	949	1,354	523	226	1,125
White spruce	7,252	1,051	1,435	1,104	752	1,727	469	714
Black spruce	6,570	198	1,745	1,120	679	1,150	576	1,102
Balsam fir	6,263	722	1,404	1,128	309	981	564	1,155
Hemlock	3,090	849	249	468	642	176	328	378
Tamarack	849	-14	127	130	163	-3	217	229
Northern white-cedar	17,080	1,399	2,109	2,783	1,526	2,754	3,937	2,572
Other softwoods	51	--	32	--	14	--	--	5
Total	59,545	6,232	11,905	9,322	7,174	8,532	7,152	9,228
HARDWOODS								
Select white oak	12	--	--	--	--	--	12	--
Select red oaks	816	3	281	51	33	38	405	5
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	1,621	369	138	135	287	221	322	149
Hard maple	18,589	4,682	2,775	1,814	2,490	2,275	2,869	1,684
Soft maple	20,833	3,922	3,571	2,781	3,685	2,406	1,637	2,831
Beech	4,169	1,544	651	239	792	411	50	482
Ash	6,172	689	544	1,395	614	214	2,456	260
Balsam poplar	2,093	106	483	607	62	388	299	148
Cottonwood	15	--	15	--	--	--	--	--
Bigtooth aspen	1,956	66	247	336	267	505	143	392
Quaking aspen	10,834	440	2,444	2,208	887	1,452	2,335	1,068
Basswood	2,020	242	263	405	51	310	686	63
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	1,989	650	215	150	415	154	94	311
Butternut	--	--	--	--	--	--	--	--
Elm	-5,230	-2,642	-49	-635	-151	-540	-1,230	17
Paper birch	6,791	103	1,057	1,068	491	1,352	1,478	1,242
Other hardwoods	10	4	6	--	--	--	--	--
Total	72,690	10,178	12,641	10,554	9,923	9,186	11,556	8,652
All species	132,235	16,410	24,546	19,876	17,097	17,718	18,708	17,880

Table 45.--Net annual growth of sawtimber on commercial forest land by species group and county, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1/]

Species group	All counties	County						
		Alger	Chippewa	Delta	Luce	Mackinac	Menominee	Schoolcraft
SOFTWOODS								
White pine	25,973	4,600	3,110	1,877	5,880	2,008	4,225	4,273
Red pine	23,613	2,431	3,964	4,114	3,430	5,316	212	4,146
Jack pine	23,253	657	7,443	1,722	5,533	2,635	15	5,248
White spruce	33,520	3,691	5,939	7,149	2,648	7,080	3,249	3,764
Black spruce	5,452	234	691	414	2,074	163	1,201	675
Balsam fir	15,119	1,694	1,880	1,798	1,938	2,803	1,671	3,335
Hemlock	19,709	5,107	1,655	2,279	5,692	808	1,585	2,583
Tamarack	3,203	-21	690	611	288	383	639	613
Northern white-cedar	40,382	4,725	5,728	5,795	6,984	7,832	4,041	5,277
Other softwoods	387	--	27	--	360	--	--	--
Total	190,611	23,118	31,127	25,759	34,827	29,028	16,838	29,914
HARDWOODS								
Select white oaks	22	--	--	--	--	--	22	--
Select red oaks	2,758	--	546	236	546	547	883	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	8,178	4,273	844	263	369	1,887	79	463
Hard maple	65,882	15,513	7,618	5,327	11,514	9,199	9,479	7,232
Soft maple	55,522	13,695	10,024	3,960	11,499	5,182	1,459	9,703
Beech	18,805	5,802	3,490	1,327	4,277	855	717	2,337
Ash	12,098	442	2,184	2,921	608	826	4,905	212
Balsam poplar	8,986	41	2,542	2,162	669	2,428	381	763
Cottonwood	77	--	77	--	--	--	--	--
Bigtooth aspen	4,336	176	1,527	276	630	906	677	144
Quaking aspen	58,263	5,979	21,605	9,301	4,321	9,220	4,619	3,218
Basswood	8,150	1,221	404	620	118	550	4,974	263
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	8,833	3,114	846	1,734	710	491	12	1,926
Butternut	--	--	--	--	--	--	--	--
Elm	-12,244	-6,762	971	-1,601	-241	-1,616	-3,372	377
Paper birch	17,076	1,045	5,173	4,311	1,884	549	871	3,243
Other hardwoods	13	13	--	--	--	--	--	--
Total	256,755	44,552	57,851	30,837	36,904	31,024	25,706	29,881
All species	447,366	67,670	88,978	56,596	71,731	60,052	42,544	59,795

[1/]International 1/4-inch rule.

Table 46.--Net annual growth of growing stock on commercial forest land by species group and ownership class, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

Species group	All owners	Ownership class									
		National Forest	Bureau of Land Mgmt.	Misc. federal	Indian	State	County & municipal	Forest industry	Farmer	Misc. priv.-corp.	Misc. priv.-indiv.
SOFTWOODS											
White pine	4,426	671	--	28	--	1,677	4	745	298	415	588
Red pine	6,437	3,768	--	45	--	1,907	103	93	208	104	209
Jack pine	7,527	3,338	--	144	--	3,215	11	174	121	98	426
White spruce	7,252	1,945	--	97	--	1,383	8	936	780	622	1,481
Black spruce	6,570	2,048	--	--	6	2,140	--	741	350	486	799
Balsam fir	6,263	916	--	23	3	600	5	946	1,247	665	1,858
Hemlock	3,090	419	--	5	--	580	--	1,029	298	192	567
Tamarack	849	-26	--	--	2	733	68	178	-21	-1	-84
Northern white-cedar	17,080	1,343	--	6	6	4,537	30	4,181	2,488	1,214	3,275
Other softwoods	51	--	--	--	--	--	--	--	32	5	14
Total	59,545	14,422	--	348	17	16,772	229	9,023	5,801	3,800	9,133
HARDWOODS											
Select white oak	12	--	--	--	--	4	--	--	--	5	3
Select red oaks	816	22	--	--	--	225	--	3	64	87	415
Other red oaks	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	1,621	110	--	29	--	275	8	300	154	182	563
Hard maple	18,589	1,981	--	10	71	3,033	15	4,319	3,400	944	4,816
Soft maple	20,833	3,170	--	24	6	5,179	64	4,638	1,927	1,600	4,225
Beech	4,169	1,010	--	--	--	373	--	1,763	110	186	727
Ash	6,172	117	--	7	96	1,336	--	1,211	1,292	266	1,847
Balsam poplar	2,093	-218	--	--	1	506	--	235	634	158	777
Cottonwood	15	--	--	--	--	15	--	--	--	--	--
Bigtooth aspen	1,956	495	--	--	1	791	--	68	87	265	249
Quaking aspen	10,834	2,016	--	15	9	1,862	--	1,203	2,195	576	2,958
Basswood	2,020	146	--	--	8	324	--	305	517	146	574
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--
Black cherry	1,989	743	--	--	5	272	13	448	140	39	329
Butternut	--	--	--	--	--	--	--	--	--	--	--
Elm	-5,230	245	--	--	-130	-1,645	--	-648	-2,007	-122	-923
Paper birch	6,791	386	--	38	15	2,097	--	893	927	800	1,635
Other hardwoods	10	--	--	--	--	--	--	4	--	--	6
Total	72,690	10,223	--	123	82	14,647	100	14,742	9,440	5,132	18,201
All species	132,235	24,645	--	471	99	31,419	329	23,765	15,241	8,932	27,334

Table 47.--Net annual growth of sawtimber on commercial forest land by species group and ownership class, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1/]

Species group	All owners	Ownership class									
		National Forest	Bureau of Land Mgmt.	Misc. federal	Indian	State	County & municipal	Forest industry	Farmer	Misc. priv.-corp.	Misc. priv.-indiv.
SOFTWOODS											
White pine	25,973	4,272	--	--	--	10,506	20	4,071	1,303	2,529	3,272
Red pine	23,613	11,286	--	935	--	9,017	--	222	359	426	1,368
Jack pine	23,253	5,876	--	1,531	--	13,940	--	559	663	711	-27
White spruce	33,520	12,581	--	101	--	7,014	--	2,827	3,385	3,273	4,339
Black spruce	5,452	1,217	--	--	--	3,108	--	1,632	-2	-222	-281
Balsam fir	15,119	1,039	--	497	429	3,141	--	1,670	2,188	1,377	4,778
Hemlock	19,709	2,251	--	28	--	4,235	--	8,239	770	1,349	2,837
Tamarack	3,203	75	--	--	--	1,424	--	395	796	415	98
Northern white-cedar	40,382	2,278	--	9	9	13,723	8	9,084	5,549	2,345	7,377
Other softwoods	387	--	--	--	--	--	--	--	27	--	360
Total	190,611	40,875	--	3,101	438	66,108	28	28,699	15,038	12,203	24,121
HARDWOODS											
Select white oaks	22	--	--	--	--	--	--	--	--	--	22
Select red oaks	2,758	--	--	--	--	422	--	--	264	161	1,911
Other red oaks	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	8,178	302	--	75	--	1,073	24	3,639	1,207	669	1,189
Hard maple	65,882	6,789	--	36	595	9,195	--	16,057	10,772	1,325	21,113
Soft maple	55,522	6,281	--	--	--	11,434	192	17,479	5,011	1,654	13,471
Beech	18,805	2,906	--	--	--	642	--	7,759	981	1,230	5,287
Ash	12,098	--	--	--	--	2,114	--	2,373	3,614	206	3,791
Balsam poplar	8,986	-274	--	--	5	877	--	2,101	1,799	1,464	3,014
Cottonwood	77	--	--	--	--	77	--	--	--	--	--
Bigtooth aspen	4,336	846	--	--	8	1,388	--	686	685	21	702
Quaking aspen	58,263	12,365	--	--	12	13,474	--	1,626	10,749	4,039	15,998
Basswood	8,150	1,173	--	--	53	923	--	2,179	2,253	259	1,310
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--
Black cherry	8,833	4,562	--	--	--	736	5	1,880	1,525	36	89
Butternut	--	--	--	--	--	--	--	--	--	--	--
Elm	-12,244	2,856	--	--	-551	-5,471	--	-1,767	-6,043	-324	-944
Paper birch	17,076	-51	--	20	--	4,360	--	1,885	5,657	1,316	3,889
Other hardwoods	13	--	--	--	--	--	--	13	--	--	--
Total	256,755	37,755	--	131	122	41,244	221	55,910	38,474	12,056	70,842
All species	447,366	78,630	--	3,232	560	107,352	249	84,609	53,512	24,259	94,963

[1/]International 1/4-inch rule.

Table 48.--Net annual growth of growing stock on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

Species group	All types	Forest type: Jack pine	Red pine	White pine	Balsam fir	White spruce	Black spruce	Northern white-cedar
SOFTWOODS								
White pine	4,426	158	239	1,458	262	77	362	386
Red pine	6,437	929	4,782	164	10	44	156	3
Jack pine	7,527	5,941	806	63	0	28	442	--
White spruce	7,252	19	159	256	2,116	768	57	334
Black spruce	6,570	298	20	28	225	8	5,181	230
Balsam fir	6,263	3	23	39	2,614	-67	314	-2,625
Hemlock	3,090	--	--	35	94	3	44	123
Tamarack	849	4	7	12	15	6	38	-243
Northern white-cedar	17,080	5	6	168	373	170	224	12,317
Other softwoods	51	--	14	--	5	--	--	--
Total	59,545	7,357	6,056	2,223	5,714	1,037	6,818	10,525
HARDWOODS								
Select white oaks	12	--	--	--	--	--	--	--
Select red oaks	816	30	--	--	--	--	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	1,621	--	--	--	42	2	3	258
Hard maple	18,589	0	0	12	21	2	16	39
Soft maple	20,833	103	187	239	522	49	151	730
Beech	4,169	--	--	8	6	1	--	--
Ash	6,172	--	--	--	85	--	--	1,003
Balsam poplar	2,093	--	--	14	80	10	9	187
Cottonwood	15	--	--	--	--	--	--	--
Bigtooth aspen	1,956	42	155	10	12	0	54	8
Quaking aspen	10,834	150	341	58	455	45	759	265
Basswood	2,020	--	--	--	4	--	--	17
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	1,989	4	19	--	3	--	6	2
Butternut	--	--	--	--	--	--	--	--
Elm	-5,230	--	--	--	-193	-22	--	-128
Paper birch	6,791	13	11	100	291	30	132	650
Other hardwoods	10	--	--	--	--	--	--	--
Total	72,690	342	713	441	1,328	117	1,130	3,031
All species	132,235	7,699	6,769	2,664	7,042	1,154	7,948	13,556

(Table 48 continued on next page)

(Table 48 continued)

Species group	Forest type							
	Tamarack	Oak-hickory	Elm-ash-soft maple	Maple-birch	Aspen	Paper birch	Exotic	Non-stocked
SOFTWOODS								
White pine	11	15	87	994	317	56	--	4
Red pine	7	12	7	44	237	16	11	15
Jack pine	--	1	--	36	191	0	--	19
White spruce	--	86	193	1,085	1,815	371	--	-7
Black spruce	49	--	32	-76	489	82	--	4
Balsam fir	14	4	844	1,316	3,209	507	--	68
Hemlock	--	--	254	2,356	139	42	--	--
Tamarack	884	--	48	3	65	4	--	6
Northern white-cedar	221	--	629	917	1,704	341	--	5
Other softwoods	--	--	--	--	--	--	32	--
Total	1,186	118	2,094	6,675	8,166	1,419	43	114
HARDWOODS								
Select white oaks	--	7	--	--	--	5	--	--
Select red oaks	--	398	11	135	220	22	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	--	--	273	920	111	12	--	--
Hard maple	--	3	91	17,726	590	89	--	--
Soft maple	--	117	2,414	13,555	2,080	685	--	1
Beech	--	--	12	4,134	8	--	--	--
Ash	--	--	2,630	1,556	777	121	--	--
Balsam poplar	7	--	79	70	1,541	98	--	-2
Cottonwood	--	--	--	15	--	--	--	--
Bigtooth aspen	--	23	13	151	1,446	41	--	1
Quaking aspen	18	30	103	737	7,529	276	--	68
Basswood	--	10	23	1,870	96	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	--	6	13	1,843	93	--	--	--
Butternut	--	--	--	--	--	--	--	--
Elm	--	--	-898	-3,430	-548	-11	--	--
Paper birch	17	25	334	640	2,579	1,966	--	3
Other hardwoods	--	--	--	4	6	--	--	--
Total	42	619	5,098	39,926	16,528	3,304	--	71
All species	1,228	737	7,192	46,601	24,694	4,723	43	185

Table 49.--Net annual growth of sawtimber on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1/]

Species group	All types	Forest type: Jack pine	Red pine	White pine	Balsam fir	White spruce	Black spruce	Northern white-cedar
SOFTWOODS								
White pine	25,973	712	1,842	9,591	1,501	336	1,818	2,203
Red pine	23,613	5,274	16,232	645	21	101	432	14
Jack pine	23,253	18,578	1,630	482	--	78	1,560	--
White spruce	33,520	59	--	856	15,536	2,438	89	1,359
Black spruce	5,452	19	86	-445	1,409	-11	4,119	753
Balsam fir	15,119	--	54	32	4,513	710	699	-6,100
Hemlock	19,709	--	--	906	416	21	196	1,433
Tamarack	3,203	--	43	58	530	--	30	188
Northern white-cedar	40,382	--	8	39	2,207	210	554	27,870
Other softwoods	387	--	360	--	--	--	--	--
Total	190,611	24,642	20,255	12,164	26,133	3,883	9,497	27,720
HARDWOODS								
Select white oaks	22	--	--	--	--	--	--	--
Select red oaks	2,758	22	--	--	--	--	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	8,178	--	--	--	146	-1	--	777
Hard maple	65,882	--	--	49	--	--	5	93
Soft maple	55,522	--	--	97	968	--	89	2,019
Beech	18,805	--	--	--	--	10	--	--
Ash	12,098	--	--	--	25	--	--	1,976
Balsam poplar	8,986	--	--	17	574	1	4	1,446
Cottonwood	77	--	--	--	--	--	--	--
Bigtooth aspen	4,336	--	277	-32	6	0	595	12
Quaking aspen	58,263	--	27	37	3,111	97	609	451
Basswood	8,150	--	--	--	28	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	8,833	--	6	--	--	--	--	--
Butternut	--	--	--	--	--	--	--	--
Elm	-12,244	--	--	--	-645	-131	--	-552
Paper birch	17,076	--	--	69	168	4	62	1,479
Other hardwoods	13	--	--	--	--	--	--	--
Total	256,755	22	310	237	4,381	-20	1,364	7,701
All species	447,366	24,664	20,565	12,401	30,514	3,863	10,861	35,421

(Table 49 continued on next page)

[1/]International 1/4-inch rule.

(Table 49 continued)

Species group	Forest type							
	Tamarack	Oak-hickory	Elm-ash-soft maple	Maple-birch	Aspen	Paper birch	Exotic	Non-stocked
SOFTWOODS								
White pine	414	66	785	4,791	1,679	212	--	23
Red pine	36	19	--	209	484	86	58	2
Jack pine	--	26	--	131	736	--	--	32
White spruce	--	42	591	3,454	6,713	2,386	--	-3
Black spruce	7	--	34	-562	25	--	--	18
Balsam fir	--	--	1,909	5,799	6,059	1,423	--	21
Hemlock	--	--	1,759	14,508	301	169	--	--
Tamarack	1,044	--	103	17	1,110	29	--	51
Northern white-cedar	124	--	1,207	3,587	4,166	399	--	11
Other softwoods	--	--	--	--	--	--	27	--
Total	1,625	153	6,388	31,934	21,273	4,704	85	155
HARDWOODS								
Select white oaks	--	22	--	--	--	--	--	--
Select red oaks	--	1,483	12	1,032	164	45	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	--	--	312	6,865	78	1	--	--
Hard maple	--	--	87	63,453	1,930	265	--	--
Soft maple	--	459	7,116	43,393	794	587	--	--
Beech	--	--	22	18,773	--	--	--	--
Ash	--	--	3,735	3,900	2,462	--	--	--
Balsam poplar	--	--	122	734	6,028	75	--	-15
Cottonwood	--	--	--	77	--	--	--	--
Bigtooth aspen	--	31	57	905	2,442	43	--	--
Quaking aspen	--	13	122	8,057	43,888	1,830	--	21
Basswood	--	69	--	6,919	1,134	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	--	--	1,313	7,502	12	--	--	--
Butternut	--	--	--	--	--	--	--	--
Elm	--	--	-2,698	-7,154	-1,064	--	--	--
Paper birch	--	--	2,290	4,234	3,923	4,847	--	--
Other hardwoods	--	--	--	13	--	--	--	--
Total	--	2,077	12,490	158,703	61,791	7,693	--	6
All species	1,625	2,230	18,878	190,637	83,064	12,397	85	161

Table 50.--Net annual growth of growing stock on commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

Forest type	All classes	Stand-age class (years)												
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-140	141+
Jack pine	7,699	182	144	684	1,705	3,182	926	499	213	164	--	--	--	--
Red pine	6,769	114	446	2,169	2,459	473	137	419	234	24	63	231	--	--
White pine	2,664	35	53	98	54	206	301	495	477	93	84	322	160	286
Balsam fir	7,042	594	807	131	1,827	1,422	1,310	234	394	100	-45	215	53	--
White spruce	1,154	5	110	32	--	565	142	-23	146	132	--	45	--	--
Black spruce	7,948	596	664	1,034	2,874	664	1,029	527	256	168	78	26	--	32
Northern white-cedar	13,556	59	794	1,134	1,544	832	923	2,637	1,048	1,304	1,084	1,028	639	530
Tamarack	1,228	20	81	94	38	90	338	312	122	29	27	77	--	--
Oak-hickory	737	--	54	--	19	122	265	120	--	34	67	--	56	--
Elm-ash-soft maple	7,192	532	434	433	409	1,038	1,197	880	455	319	528	715	210	42
Maple-birch	46,601	1,767	1,508	1,560	3,132	9,325	7,403	4,779	2,626	3,277	3,144	5,324	2,276	480
Aspen	24,694	3,489	1,918	912	4,407	5,869	4,085	2,666	322	303	689	34	--	--
Paper birch	4,723	454	127	92	228	1,001	1,426	889	198	--	205	103	--	--
Exotic	43	--	--	43	--	--	--	--	--	--	--	--	--	--
Nonstocked	185	130	12	--	14	10	12	--	--	7	--	--	--	--
All types	132,235	7,977	7,152	8,416	18,710	24,799	19,494	14,434	6,491	5,954	5,924	8,120	3,394	1,370

Table 51.--Net annual growth of sawtimber on commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1/]

Forest type	All classes	Stand-age class (years)												
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-140	141+
Jack pine	24,664	754	521	417	5,413	7,472	2,901	4,861	1,469	856	--	--	--	--
Red pine	20,565	38	1,531	1,904	8,969	3,222	965	1,846	1,068	132	281	609	--	--
White pine	12,401	79	273	218	309	1,436	821	2,345	1,576	497	740	2,055	1,023	1,029
Balsam fir	30,514	1,786	2,989	416	3,764	11,552	5,014	635	1,092	715	315	1,611	625	--
White spruce	3,863	9	291	--	--	866	193	1,061	284	964	--	195	--	--
Black spruce	10,861	744	1,676	3,271	1,517	1,333	1,045	884	171	--	116	--	--	104
Northern white-cedar	35,421	1,042	664	1,412	1,178	1,229	1,989	4,991	1,574	5,292	2,525	7,144	1,664	4,717
Tamarack	1,625	36	42	439	60	22	147	144	139	35	94	467	--	--
Oak-hickory	2,230	--	24	--	26	86	471	275	--	974	198	--	176	--
Elm-ash-soft maple	18,878	298	775	279	116	652	3,634	1,460	2,115	2,537	1,991	3,895	988	138
Maple-birch	190,637	3,624	3,481	5,441	11,503	28,087	25,141	18,686	11,633	20,525	21,068	28,812	8,968	3,668
Aspen	83,064	5,686	2,194	917	19,184	22,517	12,576	10,551	2,379	1,695	4,426	939	--	--
Paper birch	12,397	1,645	236	--	39	4,084	2,233	1,521	872	--	856	911	--	--
Exotic	85	--	--	85	--	--	--	--	--	--	--	--	--	--
Nonstocked	161	8	26	--	--	70	35	--	--	22	--	--	--	--
All types	447,366	15,749	14,723	14,799	52,078	82,628	57,165	49,260	24,372	34,244	32,610	46,638	13,444	9,656

[1/] International 1/4-inch rule.

Table 52.--Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

Forest type and stand-size class	All classes	Basal area class (square feet per acre)													
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-150	151-180	181+
Jack pine															
Sawtimber	1,300	--	--	--	25	167	98	233	333	57	165	222	--	--	--
Poletimber	6,146	--	12	171	362	363	362	230	553	320	1,281	1,136	1,356	--	--
Sapling & seedling	253	11	46	65	119	--	--	--	12	--	--	--	--	--	--
All stands	7,699	11	58	236	506	530	460	463	898	377	1,446	1,358	1,356	--	--
Red pine															
Sawtimber	1,968	--	13	--	24	37	46	71	280	--	303	347	484	223	140
Poletimber	4,386	--	--	--	--	88	62	217	712	--	--	1,305	211	978	813
Sapling & seedling	415	--	234	64	98	--	19	--	--	--	--	--	--	--	--
All stands	6,769	--	247	64	122	125	127	288	992	--	303	1,652	695	1,201	953
White pine															
Sawtimber	1,891	--	--	19	49	36	151	69	574	30	291	533	56	83	--
Poletimber	649	--	--	--	--	96	50	40	--	--	--	463	--	--	--
Sapling & seedling	124	11	23	--	33	--	--	57	--	--	--	--	--	--	--
All stands	2,664	11	23	19	82	132	201	166	574	30	291	996	56	83	--
Balsam fir															
Sawtimber	1,338	--	--	--	--	--	33	--	--	168	203	648	231	--	55
Poletimber	4,182	--	--	--	24	89	--	143	436	544	927	744	877	120	278
Sapling & seedling	1,522	6	-12	60	359	199	163	351	146	198	39	23	-10	--	--
All stands	7,042	6	-12	60	383	288	196	494	582	910	1,169	1,415	1,098	120	333
White spruce															
Sawtimber	343	--	--	--	38	--	--	--	--	--	--	44	74	151	36
Poletimber	664	--	--	--	--	--	--	--	--	--	138	108	310	--	108
Sapling & seedling	147	--	42	--	27	--	--	78	--	--	--	--	--	--	--
All stands	1,154	--	42	--	65	--	--	78	--	--	138	152	384	151	144
Black spruce															
Sawtimber	222	--	--	--	--	--	32	--	20	121	--	49	--	--	--
Poletimber	5,569	6	--	--	485	127	398	282	232	90	460	3,002	395	92	--
Sapling & seedling	2,157	-1	142	26	205	231	268	471	70	147	356	215	27	--	--
All stands	7,948	5	142	26	690	358	698	753	322	358	816	3,266	422	92	--
Northern white-cedar															
Sawtimber	2,104	--	--	--	49	13	51	103	169	--	91	629	474	391	134
Poletimber	8,625	--	--	--	24	20	16	58	160	181	556	879	2,541	1,692	2,498
Sapling & seedling	2,827	--	5	16	40	71	68	509	237	35	327	472	681	362	4
All stands	13,556	--	5	16	113	104	135	670	566	216	974	1,980	3,696	2,445	2,636

(Table 52 continued on next page)

(Table 52 continued)

Forest type and stand-size class	All classes	Basal area class (square feet per acre)													
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-150	151-180	181+
Tamarack															
Sawtimber	77	--	--	--	--	--	--	--	77	--	--	--	--	--	--
Poletimber	891	--	--	--	96	137	96	146	102	187	127	--	--	--	--
Sapling & seedling	260	6	8	12	48	73	24	--	34	31	10	--	14	--	--
All stands	1,228	6	8	12	144	210	120	146	213	218	137	0	14	0	0
Oak-hickory															
Sawtimber	243	--	--	--	21	--	--	99	56	--	--	67	--	--	--
Poletimber	440	--	--	--	--	--	35	166	64	77	26	72	--	--	--
Sapling & seedling	54	--	--	--	--	--	--	54	--	--	--	--	--	--	--
All stands	737	--	--	--	21	--	35	319	120	77	26	139	--	--	--
Elm-ash-soft maple															
Sawtimber	2,116	--	--	--	--	53	17	52	376	--	12	118	878	583	27
Poletimber	3,631	--	--	--	43	230	57	332	83	71	631	484	1,276	424	--
Sapling & seedling	1,445	12	14	120	42	92	378	271	97	78	150	131	60	--	--
All stands	7,192	12	14	120	85	375	452	655	556	149	793	733	2,214	1,007	27
Maple-birch															
Sawtimber	18,553	--	21	--	97	59	41	704	2,395	1,785	2,095	5,103	4,145	1,691	417
Poletimber	23,941	--	12	42	313	189	152	901	1,446	1,845	3,927	5,518	7,085	2,562	-51
Sapling & seedling	4,108	9	-11	149	330	598	363	600	656	881	174	252	106	--	--
All stands	46,601	9	22	191	740	846	556	2,205	4,497	4,511	6,196	10,873	11,336	4,253	366
Aspen															
Sawtimber	2,303	--	--	--	18	174	37	200	225	29	439	66	834	219	62
Poletimber	16,959	--	56	35	269	300	630	1,067	1,434	1,916	2,719	2,841	2,635	2,575	482
Sapling & seedling	5,432	43	377	740	629	1,522	778	81	511	189	413	121	28	--	--
All stands	24,694	43	433	775	916	1,996	1,445	1,348	2,170	2,134	3,571	3,028	3,497	2,794	544
Paper birch															
Sawtimber	642	--	--	--	--	--	--	210	--	--	--	53	379	--	--
Poletimber	3,603	--	--	--	--	357	300	283	408	--	1,018	647	300	113	177
Sapling & seedling	478	4	--	12	184	119	--	40	81	25	13	--	--	--	--
All stands	4,723	4	--	12	184	476	300	533	489	25	1,031	700	679	113	177
Exotic															
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	43	--	--	--	--	--	--	--	--	--	--	43	--	--	--
Sapling & seedling	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All stands	43	--	--	--	--	--	--	--	--	--	--	43	--	--	--
Nonstocked	185	90	41	2	6	--	-2	--	48	--	--	--	--	--	--
All types															
Sawtimber	33,100	--	34	19	321	539	506	1,741	4,505	2,190	3,599	7,879	7,555	3,341	871
Poletimber	79,729	6	80	248	1,616	1,996	2,158	3,865	5,630	5,231	11,810	17,242	16,986	8,556	4,305
Sapling & seedling	19,221	101	868	1,264	2,114	2,905	2,061	2,512	1,844	1,584	1,482	1,214	906	362	4
Nonstocked	185	90	41	2	6	--	-2	--	48	--	--	--	--	--	--
All stands	132,235	197	1,023	1,533	4,057	5,440	4,723	8,118	12,027	9,005	16,891	26,335	25,447	12,259	5,180

Table 53.--Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1/]

Forest type and stand-size class	All classes	Basal area class (square feet per acre)													
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-150	151-180	181+
Jack pine															
Sawtimber	9,948	--	--	--	53	765	947	1,140	1,862	696	1,433	3,052	--	--	--
Poletimber	13,918	--	--	147	1,580	1,456	431	335	555	2,291	3,396	2,305	1,422	--	--
Sapling & seedling	798	21	151	17	546	--	--	--	63	--	--	--	--	--	--
All stands	24,664	21	151	164	2,179	2,221	1,378	1,475	2,480	2,987	4,829	5,357	1,422	--	--
Red pine															
Sawtimber	11,130	--	74	--	132	93	226	725	1,400	--	1,416	2,085	3,348	1,363	268
Poletimber	8,436	--	--	--	--	103	693	413	1,661	--	--	3,402	67	1,393	704
Sapling & seedling	999	--	--	639	--	--	360	--	--	--	--	--	--	--	--
All stands	20,565	--	74	639	132	196	1,279	1,138	3,061	--	1,416	5,487	3,415	2,756	972
White pine															
Sawtimber	9,307	--	--	410	147	139	331	444	2,277	166	1,877	2,188	573	755	--
Poletimber	2,655	--	--	--	--	409	97	88	--	--	--	2,061	--	--	--
Sapling & seedling	439	65	123	--	164	--	--	87	--	--	--	--	--	--	--
All stands	12,401	65	123	410	311	548	428	619	2,277	166	1,877	4,249	573	755	--
Balsam fir															
Sawtimber	12,988	--	--	--	--	--	86	--	--	318	1,112	9,731	712	--	1,029
Poletimber	12,334	--	--	--	63	78	--	32	1,782	751	2,589	2,605	2,552	609	1,273
Sapling & seedling	5,192	--	28	1,010	299	2,280	462	298	96	676	9	34	--	--	--
All stands	30,514	--	28	1,010	362	2,358	548	330	1,878	1,745	3,710	12,370	3,264	609	2,302
White spruce															
Sawtimber	2,632	--	--	--	108	--	--	--	--	--	--	98	824	401	1,201
Poletimber	932	--	--	--	--	--	--	--	--	--	338	99	384	--	111
Sapling & seedling	299	--	66	--	85	--	--	148	--	--	--	--	--	--	--
All stands	3,863	--	66	--	193	--	--	148	--	--	338	197	1,208	401	1,312
Black spruce															
Sawtimber	381	--	--	--	--	--	104	--	-21	147	--	151	--	--	--
Poletimber	6,021	--	--	--	1,217	74	119	665	863	19	1,317	1,048	180	519	--
Sapling & seedling	4,459	-5	1,510	--	141	549	646	327	514	551	152	26	48	--	--
All stands	10,861	-5	1,510	--	1,358	623	869	992	1,356	717	1,469	1,225	228	519	--
Northern white-cedar															
Sawtimber	14,572	--	--	--	181	25	227	469	878	--	795	2,867	2,405	3,338	3,387
Poletimber	17,076	--	--	--	31	16	--	75	16	-817	1,444	3,000	3,540	4,328	5,443
Sapling & seedling	3,773	--	--	37	27	425	19	1,004	469	491	17	1,085	-115	297	17
All stands	35,421	--	--	37	239	466	246	1,548	1,363	-326	2,256	6,952	5,830	7,963	8,847

(Table 53 continued on next page)

(Table 53 continued)

Forest type and stand-size class	All classes	Basal area class (square feet per acre)													
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-150	151-180	181+
Tamarack															
Sawtimber	467	--	--	--	--	--	--	--	467	--	--	--	--	--	--
Poletimber	580	--	--	--	29	61	60	150	86	115	79	--	--	--	--
Sapling & seedling	578	--	--	36	60	--	68	--	--	--	--	--	414	--	--
All stands	1,625	--	--	36	89	61	128	150	553	115	79	0	414	--	--
Oak-hickory															
Sawtimber	650	--	--	--	131	--	--	144	177	--	--	198	--	--	--
Poletimber	1,556	--	--	--	--	--	973	211	131	114	30	97	--	--	--
Sapling & seedling	24	--	--	--	--	--	--	24	--	--	--	--	--	--	--
All stands	2,230	--	--	--	131	--	973	379	308	114	30	295	--	--	--
Elm-ash-soft maple															
Sawtimber	10,055	--	--	--	--	980	62	665	839	--	39	576	3,242	3,530	122
Poletimber	7,471	--	--	--	9	89	152	-15	2,007	--	1,643	61	2,910	615	--
Sapling & seedling	1,352	--	52	55	71	23	75	184	137	-262	547	--	470	--	--
All stands	18,878	--	52	55	80	1,092	289	834	2,983	-262	2,229	637	6,622	4,145	122
Maple-birch															
Sawtimber	100,955	--	465	--	413	1,265	161	3,027	10,125	7,376	19,091	25,381	23,968	6,651	3,032
Poletimber	81,419	--	15	18	128	807	604	804	6,918	8,768	10,264	16,532	26,254	9,997	310
Sapling & seedling	8,263	25	--	46	732	960	503	2,619	807	1,149	269	1,083	70	--	--
All stands	190,637	25	480	64	1,273	3,032	1,268	6,450	17,850	17,293	29,624	42,996	50,292	16,648	3,342
Aspen															
Sawtimber	18,317	--	--	59	47	2,727	86	906	1,218	645	2,047	181	6,046	1,762	2,593
Poletimber	56,998	--	8	468	67	713	436	4,310	3,089	10,511	11,979	8,680	9,357	5,609	1,771
Sapling & seedling	7,749	106	350	767	1,827	2,448	450	222	229	678	57	615	--	--	--
All stands	83,064	106	358	1,294	1,941	5,888	972	5,438	4,536	11,834	14,083	9,476	15,403	7,371	4,364
Paper birch															
Sawtimber	2,375	--	--	--	--	--	--	247	--	--	--	755	1,373	--	--
Poletimber	9,576	--	--	--	--	3,286	1,436	75	1,573	--	1,006	412	1,526	169	93
Sapling & seedling	446	29	--	23	--	285	--	59	--	50	--	--	--	--	--
All stands	12,397	29	--	23	--	3,571	1,436	381	1,573	50	1,006	1,167	2,899	169	93
Exotic															
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	85	--	--	--	--	--	--	--	--	--	--	85	--	--	--
Sapling & seedling	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All stands	85	--	--	--	--	--	--	--	--	--	--	85	--	--	--
Nonstocked	161	32	153	38	5	--	-41	--	-26	--	--	--	--	--	--
All types															
Sawtimber	193,777	--	539	469	1,212	5,994	2,230	7,767	19,222	9,348	27,810	47,263	42,491	17,800	11,632
Poletimber	219,057	--	23	633	3,124	7,092	5,001	7,143	18,681	21,752	34,085	40,387	48,192	23,239	9,705
Spling & seedling	34,371	241	2,280	2,630	3,952	6,970	2,583	4,972	2,315	3,333	1,051	2,843	887	297	17
Nonstocked	161	32	153	38	5	--	-41	--	-26	--	--	--	--	--	--
All stands	447,366	273	2,995	3,770	8,293	20,056	9,773	19,882	40,192	34,433	62,946	90,493	91,570	41,336	21,354

1/International 1/4-inch rule.

Table 54.--Timber removals[1/] from growing stock on commercial forest land by species group and county
Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

Species group	All counties	County						
		Alger	Chippewa	Delta	Luce	Mackinac	Menominee	Schoolcraft
SOFTWOODS								
White pine	1,691	257	141	173	428	69	289	334
Red pine	1,422	156	149	316	256	70	106	369
Jack pine	5,230	410	976	484	1,997	352	106	905
White spruce	997	74	130	193	125	213	201	61
Black spruce	1,432	43	238	201	272	198	327	153
Balsam fir	4,273	298	389	1,072	461	474	1260	319
Hemlock	2,554	691	117	337	502	89	563	255
Tamarack	151	5	21	24	17	5	63	16
Northern white-cedar	3,396	185	207	864	143	234	1484	279
Other softwoods	--	--	--	--	--	--	--	--
Total	21,146	2,119	2,368	3,664	4,201	1,704	4,399	2,691
HARDWOODS								
Select white oaks	17	--	--	3	--	--	14	--
Select red oaks	151	15	22	22	44	13	23	12
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	1,616	495	153	226	278	82	139	243
Hard maple	9,179	2,958	573	813	1,576	739	1210	1310
Soft maple	3,189	646	138	615	341	203	577	669
Beech	3,444	1,241	281	96	885	189	61	691
Ash	313	24	35	43	9	33	155	14
Balsam poplar	926	85	43	269	47	118	188	176
Cottonwood	--	--	--	--	--	--	--	--
Bigtooth aspen	1,509	66	117	408	55	217	433	213
Quaking aspen	8,658	273	914	2,383	384	869	2936	899
Basswood	482	56	91	51	18	66	176	24
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Butternut	--	--	--	--	--	--	--	--
Elm	1,289	252	64	257	89	123	369	135
Paper birch	2,471	227	180	649	157	212	618	428
Other hardwoods[2/]	108	38	4	22	17	1	8	18
Total	33,352	6,376	2,615	5,857	3,900	2,865	6,907	4,832
All species	54,498	8,495	4,983	9,521	8,101	4,569	11,306	7,523

[1/] Removals in 1979 are trend-level removals.
[2/] Includes black cherry.

Table 55.--Timber removals[1] from sawtimber on commercial forest land by species group and county, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[2]

Species group	All counties	County						
		Alger	Chippewa	Delta	Luce	Mackinac	Menominee	Schoolcraft
SOFTWOODS								
White pine	7,518	1,161	564	585	2,021	238	1,402	1,547
Red pine	5,571	501	601	922	1,094	250	428	1,775
Jack pine	11,894	887	2,112	1,044	4,763	764	230	2,094
White spruce	4,617	257	615	794	631	900	1086	334
Black spruce	1,761	68	363	204	425	260	235	206
Balsam fir	10,525	741	1,010	2,628	1,191	1,263	2,889	803
Hemlock	9,043	2,592	449	992	1,628	319	2,234	829
Tamarack	426	14	55	58	38	10	215	36
Northern white-cedar	7,071	364	477	1,837	264	503	3,102	524
Other softwoods	--	--	--	--	--	--	--	--
Total	58,426	6,585	6,246	9,064	12,055	4,507	11,821	8,148
HARDWOODS								
Select white oaks	8	--	--	1	--	--	7	--
Select red oaks	611	53	118	40	224	68	74	34
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	7,114	2,278	545	720	1,482	295	514	1,280
Hard maple	42,700	14,740	2,075	3,017	8,042	3,145	4,882	6,799
Soft maple	9,039	2,372	358	1,061	1,339	724	1,214	1,971
Beech	17,080	6,488	1,335	407	4,500	767	271	3,312
Ash	1,024	102	187	110	31	155	391	48
Balsam poplar	1,645	129	72	453	72	268	391	260
Cottonwood	--	--	--	--	--	--	--	--
Bigtooth aspen	2,868	122	356	852	121	333	726	358
Quaking aspen	18,022	511	2,650	3,879	1,094	2,089	6,084	1,715
Basswood	2,404	267	473	225	94	338	890	117
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Butternut	--	--	--	--	--	--	--	--
Elm	4,917	1,069	276	723	374	579	1,392	504
Paper birch	6,071	464	503	1,436	357	576	1,679	1,056
Other hardwoods[3]	377	168	7	52	72	4	20	54
Total	113,880	28,763	8,955	12,976	17,802	9,341	18,535	17,508
All species	172,306	35,348	15,201	22,040	29,857	13,848	30,356	25,656

1/Removals in 1979 are trend-level removals.

2/International 1/4-inch rule.

3/Includes black cherry.

Table 56.--Timber removals[1] from growing stock and sawtimber on commercial forest land by species group, Eastern Upper Peninsula, Michigan, 1965 and 1979

Species group	Growing stock		Sawtimber	
	[2]1965	1979	[2]1965	1979
	Thousand cubic feet		[3]Thousand board feet	
SOFTWOODS				
White pine	874	1,691	3,867	7,518
Red pine	883	1,422	3,482	5,571
Jack pine	4,539	5,230	12,417	11,894
White spruce	1,055	997	5,274	4,617
Black spruce	1,602	1,432	4,235	1,761
Balsam fir	4,145	4,273	13,786	10,525
Hemlock	2,882	2,554	15,649	9,043
Tamarack	256	151	954	426
Northern white-cedar	5,667	3,396	7,418	7,071
Other softwoods	--	--	--	--
Total	21,903	21,146	67,082	58,426
HARDWOODS				
Select white oaks	2	17	20	8
Select red oaks	92	151	517	611
Other red oaks	2	--	5	--
Hickory	--	--	--	--
Yellow birch	2,184	1,616	12,217	7,114
Hard maple	6,237	9,179	33,227	42,700
Soft maple	614	3,189	3,384	9,039
Beech	2,465	3,444	15,463	17,080
Ash	95	313	516	1,024
Balsam poplar	884	926	5,154	1,645
Cottonwood	--	--	--	--
Bigtooth aspen	2,333	1,509	8,961	2,868
Quaking aspen	9,596	8,658	20,132	18,022
Basswood	199	482	1,191	2,404
Yellow-poplar	--	--	--	--
Black walnut	--	--	--	--
Butternut	--	--	--	--
Elm	369	1,289	2,033	4,917
Paper birch	979	2,471	4,941	6,071
Other hardwoods[4]	150	108	858	377
Total	26,201	33,352	108,619	113,880
All species	48,104	54,498	175,701	172,306

[1]Removals in 1979 are trend-level removals.

[2]Figures have been adjusted from those published after the 1966 survey to conform to 1980 volumes because of changes in survey definitions and procedures.

[3]International 1/4-inch rule.

[4]Includes black cherry.

Table 57.--Timber removals[1] from growing stock and sawtimber on commercial forest land by item and species category, Eastern Upper Peninsula, Michigan, 1979

Item	Growing stock						Sawtimber					
	All species	Pine	Other softwoods	Aspen	Hard maple	Other hardwoods	All species	Pine	Other softwoods	Aspen	Hard maple	Other hardwoods
	Thousand cubic feet						[2] Thousand board feet					
ROUNDWOOD PRODUCTS												
Pulpwood	26,753	5,923	7,117	7,623	860	5,230	56,240	13,569	18,936	12,797	2,362	8,576
Saw logs	13,234	1,792	1,165	1,075	4,585	4,617	75,902	10,406	6,327	5,241	27,846	26,082
Fuelwood	472	[4]	9	40	136	287	1,593	15	46	128	446	958
Posts	1,868	--	1,868	--	--	--	1,924	--	1,924	--	--	--
Veneer logs	1,064	4	--	8	489	563	7,758	27	--	55	3,575	4,101
Poles	39	39	--	--	--	--	157	157	--	--	--	--
Other[3]	1,062	7	291	675	--	89	2,241	29	942	1,128	--	142
Subtotal	44,492	7,765	10,450	9,421	6,070	10,786	145,815	24,203	28,175	19,349	34,229	39,859
LOGGING RESIDUE	3,312	280	702	422	803	1,105	6,692	255	1,736	182	2,238	2,281
OTHER REMOVALS	6,694	298	1,651	324	2,306	2,115	19,799	525	3,532	1,359	6,233	8,150
TOTAL	54,498	8,343	12,803	10,167	9,179	14,006	172,306	24,983	33,443	20,890	42,700	50,290

[1] Removals in 1979 are trend-level removals.
[2] International 1/4-inch rule.
[3] Includes charcoal wood, shingle bolts, cabin logs, particleboard bolts, piling, etc.
[4] Less than 500 cubic feet.

Table 58.--Net annual growth and removals[1/] of growing stock on commercial forest land by species group, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

Species group	Net annual growth	Annual timber removals
SOFTWOODS		
White pine	4,426	1,691
Red pine	6,437	1,422
Jack pine	7,527	5,230
White spruce	7,252	997
Black spruce	6,570	1,432
Balsam fir	6,263	4,273
Hemlock	3,090	2,554
Tamarack	849	151
Northern white-cedar	17,080	3,396
Other softwoods	51	--
Total	59,545	21,146
HARDWOODS		
Select white oaks	12	17
Select red oaks	816	151
Other red oaks	--	--
Hickory	--	--
Yellow birch	1,621	1,616
Hard maple	18,589	9,179
Soft maple	20,833	3,189
Beech	4,169	3,444
Ash	6,172	313
Balsam poplar	2,093	926
Cottonwood	15	--
Bigtooth aspen	1,956	1,509
Quaking aspen	10,834	8,658
Basswood	2,020	482
Yellow-poplar	--	--
Black walnut	--	--
Butternut	--	--
Elm	-5,230	1,289
Paper birch	6,791	2,471
Other hardwoods[2/]	1,999	108
Total	72,690	33,352
All species	132,235	54,498

[1/] Removals in 1979 are trend-level removals.

[2/] Includes black cherry.

Table 59.--Net annual growth and removals[1/] of sawtimber on commercial forest land by species group, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[2/]

Species group	Net annual growth	Annual timber removals
SOFTWOODS		
White pine	25,973	7,518
Red pine	23,613	5,571
Jack pine	23,253	11,894
White spruce	33,520	4,617
Black spruce	5,452	1,761
Balsam fir	15,119	10,525
Hemlock	19,709	9,043
Tamarack	3,203	426
Northern white-cedar	40,382	7,071
Other softwoods	387	--
Total	190,611	58,426
HARDWOODS		
Select white oaks	22	8
Select red oaks	2,758	611
Other red oaks	--	--
Hickory	--	--
Yellow birch	8,178	7,114
Hard maple	65,882	42,700
Soft maple	55,522	9,039
Beech	18,805	17,080
Ash	12,098	1,024
Balsam poplar	8,986	1,645
Cottonwood	77	--
Bigtooth aspen	4,336	2,868
Quaking aspen	58,263	18,022
Basswood	8,150	2,404
Yellow-poplar	--	--
Black walnut	--	--
Butternut	--	--
Elm	-12,244	4,917
Paper birch	17,076	6,071
Other hardwoods[3/]	8,846	377
Total	256,755	113,880
All species	447,366	172,306

[1/]Removals in 1979 are trend-level removals.

[2/]International 1/4-inch rule.

[3/]Includes black cherry.

Table 60.--Net annual growth and removals[1/] of growing stock on commercial forest land by ownership class and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

Ownership class	Net annual growth			Annual timber removals		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
National Forest	24,645	14,422	10,223	7,696	4,055	3,641
Bureau of Land Mgmt.	--	--	--	--	--	--
Miscellaneous federal	471	348	123	126	100	26
Indian	99	17	82	47	1	46
State	31,419	16,772	14,647	7,463	3,998	3,465
County and municipal	329	229	100	8	3	5
Forest industry	23,765	9,023	14,742	[2/]11,179	[2/]2,412	[2/]8,767
Farmer	15,241	5,801	9,440	[2/]27,979	[2/]10,577	[2/]17,402
Misc. private-corp.	8,932	3,800	5,132	--	--	--
Misc. private-indiv.	27,334	9,133	18,201	--	--	--
All owners	132,235	59,545	72,690	54,498	21,146	33,352

[1/]Removals in 1979 are trend-level removals.
[2/]Includes miscellaneous private-corporation and miscellaneous private-indivdual.

Table 61.--Net annual growth and removals[1/] of sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[2/]

Ownership class	Net annual growth			Annual timber removals		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
National Forest	78,630	40,875	37,755	18,640	10,556	8,084
Bureau of Land Mgmt.	--	--	--	--	--	--
Miscellaneous federal	3,232	3,101	131	297	240	57
Indian	560	438	122	108	1	107
State	107,352	66,108	41,244	21,111	10,434	10,677
County and municipal	249	28	221	23	6	17
Forest industry	84,609	28,699	55,910	[3/]46,900	[3/]8,454	[3/]38,446
Farmer	53,512	15,038	38,474	[3/]85,227	[3/]28,735	[3/]56,492
Misc. private-corp.	24,259	12,203	12,056	--	--	--
Misc. private-indiv.	94,963	24,121	70,842	--	--	--
All owners	447,366	190,611	256,755	172,306	58,426	113,880

[1/]Removals in 1979 are trend-level removals.
[2/]International 1/4-inch rule.
[3/]Includes miscellaneous private-corporation and miscellaneous private-individual.

Table 62.--Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1965[1/] and 1979

(In million cubic feet)

Species	1965[1/]	1979
Softwoods	13.0	16.8
Hardwoods	19.5	24.0
Total	32.5	40.8

1/Figures have been adjusted from those published after the 1965 survey to conform to 1979 volumes because of changes in survey definitions and procedures.

Table 63.--Annual mortality of growing stock on commercial forest land by species group and cause, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

Species group	All causes	Cause						
		Insects	Disease	Fire	Animals	Weather	Suppression	Unknown and other
SOFTWOODS								
White pine	293	--	59	9	--	45	7	173
Red pine	6	--	--	--	--	2	--	4
Jack pine	593	--	77	--	34	41	--	441
White spruce	583	53	65	--	--	112	--	353
Black spruce	1,391	407	167	18	--	72	--	727
Balsam fir	10,578	2,771	1,166	--	--	1,368	25	5,248
Hemlock	200	12	48	--	--	26	3	111
Tamarack	1,476	108	366	86	142	60	--	714
Northern white-cedar	1,702	15	330	--	--	406	--	951
Other softwoods	3	--	--	--	--	--	--	3
Total	16,825	3,366	2,278	113	176	2,132	35	8,725
HARDWOODS								
Select white oaks	1	--	--	--	--	--	--	1
Select red oaks	101	--	66	--	1	6	--	28
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	791	--	362	--	--	--	--	429
Hard maple	2,534	--	544	--	--	676	--	1,314
Soft maple	914	--	155	--	36	233	--	490
Beech	573	--	--	--	--	573	--	--
Ash	434	--	129	--	--	48	--	257
Balsam poplar	1,985	--	579	--	--	101	--	1,305
Cottonwood	1	--	--	--	--	--	--	1
Bigtooth aspen	898	--	337	--	--	192	--	369
Quaking aspen	6,930	--	3,191	--	257	824	--	2,658
Basswood	166	--	68	--	--	--	--	98
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	114	--	--	--	--	29	--	85
Butternut	--	--	--	--	--	--	--	--
Elm	6,961	19	6,359	--	--	19	--	564
Paper birch	1,563	--	579	--	--	121	--	863
Other hardwoods	2	--	--	--	--	--	--	2
Total	23,968	19	12,369	--	294	2,822	--	8,464
All species	40,793	3,385	14,647	113	470	4,954	35	17,189

Table 64.--Annual mortality of sawtimber on commercial forest land by species group and cause, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1/]

Species group	All causes	Cause						
		Insects	Disease	Fire	Animals	Weather	Suppression	Unknown and other
SOFTWOODS								
White pine	1,373	--	279	--	--	307	--	787
Red pine	--	--	--	--	--	--	--	--
Jack pine	852	--	165	--	--	--	--	687
White spruce	2,327	364	293	--	--	610	--	1,060
Black spruce	3,192	1,513	188	--	--	--	--	1,491
Balsam fir	15,614	2,688	1,683	--	--	3,122	--	8,121
Hemlock	953	62	246	--	--	126	--	519
Tamarack	1,625	197	275	--	--	--	--	1,153
Northern white-cedar	3,930	61	668	--	--	1,088	--	2,113
Other softwoods	3	--	--	--	--	--	--	3
Total	29,869	4,885	3,797	--	--	5,253	--	15,934
HARDWOODS								
Select white oaks	2	--	--	--	--	--	--	2
Select red oaks	305	--	222	--	4	21	--	58
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	3,022	--	1,732	--	--	--	--	1,290
Hard maple	6,083	--	1,509	--	--	1,714	--	2,860
Soft maple	2,126	--	569	--	--	595	--	962
Beech	2,458	--	--	--	--	2,458	--	--
Ash	506	--	166	--	--	--	--	340
Balsam poplar	5,920	--	1,922	--	--	720	--	3,278
Cottonwood	6	--	--	--	--	--	--	6
Bigtooth aspen	1,498	--	455	--	--	499	--	544
Quaking aspen	9,226	--	3,453	--	1,040	1,961	--	2,772
Basswood	448	--	264	--	--	--	--	184
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	163	--	--	--	--	163	--	--
Butternut	--	--	--	--	--	--	--	--
Elm	19,191	--	18,152	--	--	--	--	1,039
Paper birch	1,835	--	921	--	--	208	--	706
Other hardwoods	2	--	--	--	--	--	--	2
Total	52,791	--	29,365	--	1,044	8,339	--	14,043
All species	82,660	4,885	33,162	--	1,044	13,592	--	29,977

[1/]International 1/4-inch rule.

Table 65.--Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1979

Ownership class	Growing stock			Sawtimber		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
	Thousand cubic feet			1/ Thousand board feet		
National Forest	6,288	2,096	4,192	10,024	5,175	4,849
Bureau of Land Management	--	--	--	--	--	--
Miscellaneous federal	54	39	15	104	84	20
Indian	187	5	182	675	1	674
State	10,242	4,933	5,309	21,576	9,301	12,275
County and municipal	18	9	9	22	2	20
Forest industry	6,181	2,948	3,233	14,315	5,198	9,117
Farmer	7,207	2,193	5,014	15,029	2,555	12,474
Misc. private-corp.	2,170	1,066	1,104	4,418	2,088	2,330
Misc. private-indiv.	8,446	3,536	4,910	16,497	5,465	11,032
All owners	40,793	16,825	23,968	82,660	29,869	52,791

1/ International 1/4-inch rule.

Table 66.--Output of timber products by source of material and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1978

Product	Standard units	Total		Roundwood products: Growing stock		Roundwood products: Nongrowing stock		Plant byproducts	
		No. of units	Thousand cubic feet	No. of units	Thousand cubic feet	No. of units	Thousand cubic feet	No. of units	Thousand cubic feet
PULPWOOD									
Softwood	1/Standard	190,029	14,994	165,273	13,040	17,326	1,367	7,430	587
Hardwood	cords	228,780	18,052	173,808	13,713	30,343	2,394	24,629	1,945
Total		418,809	33,046	339,081	26,753	47,669	3,761	32,059	2,532
SAW LOGS									
Softwood	2/Thousand	17,610	3,059	17,023	2,957	587	102	--	--
Hardwood	board feet	63,002	10,576	61,221	10,277	1,781	299	--	--
Total		80,612	13,635	78,244	13,234	2,368	401	--	--
VENEER LOGS									
Softwood	2/Thousand	27	4	27	4	--	--	--	--
Hardwood	board feet	7,731	1,060	7,731	1,060	--	--	--	--
Total		7,758	1,064	7,758	1,064	--	--	--	--
FUELWOOD									
Softwood	1/Standard	5,778	380	194	9	841	39	4,743	332
Hardwood	cords	47,410	3,305	6,667	463	18,029	1,252	22,714	1,590
Total		53,188	3,685	6,861	472	18,870	1,291	27,457	1,922
POSTS									
Softwood	Thousand	1,999	2,056	1,816	1,868	183	188	--	--
Hardwood	pieces	--	--	--	--	--	--	--	--
Total		1,999	2,056	1,816	1,868	183	188	--	--
POLES									
Softwood	Pieces	4,614	39	4,614	39	--	--	--	--
Hardwood		--	--	--	--	--	--	--	--
Total		4,614	39	4,614	39	--	--	--	--
OTHER3/									
Softwood	Thousand	439	439	298	298	--	--	141	141
Hardwood	cubic feet	2,231	2,231	764	764	61	61	1,406	1,406
Total		2,670	2,670	1,062	1,062	61	61	1,547	1,547
ALL PRODUCTS									
Softwood	Thousand	--	20,971	--	18,215	--	1,696	--	1,060
Hardwood	cubic feet	--	35,224	--	26,277	--	4,006	--	4,941
Total		--	56,195	--	44,492	--	5,702	--	6,001

1/Rough-wood, 128 cubic foot basis.

2/International 1/4-inch rule.

3/Other (industrial production) includes cabin logs, charcoal wood, particleboard bolts, shingle bolts, pilings, etc.

Table 67.--Output of roundwood products by source and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1978

(In thousand cubic feet)

Product and species group	All sources	Growing-stock trees			Rough and rotten trees	Salvable dead trees	Other sources
		Total	Sawtimber	Poletimber			
INDUSTRIAL PRODUCTS							
Saw logs							
Softwood	3,059	2,957	2,910	47	1	41	60
Hardwood	10,576	10,277	9,900	377	91	--	208
Subtotal	13,635	13,234	12,810	424	92	41	268
Veneer logs and bolts							
Softwood	4	4	4	--	--	--	--
Hardwood	1,060	1,060	1,060	--	--	--	--
Subtotal	1,064	1,064	1,064	--	--	--	--
Pulpwood							
Softwood	14,407	13,040	8,495	4,545	227	329	811
Hardwood	16,107	13,713	6,054	7,659	1,342	146	906
Subtotal	30,514	26,753	14,549	12,204	1,569	475	1,717
Cooperage							
Softwood	--	--	--	--	--	--	--
Hardwood	--	--	--	--	--	--	--
Subtotal	--	--	--	--	--	--	--
Piling							
Softwood	5	5	5	--	--	--	--
Hardwood	--	--	--	--	--	--	--
Subtotal	5	5	5	--	--	--	--
Poles							
Softwood	39	39	32	7	--	--	--
Hardwood	--	--	--	--	--	--	--
Subtotal	39	39	32	7	--	--	--
Mine timbers (Round)							
Softwood	--	--	--	--	--	--	--
Hardwood	--	--	--	--	--	--	--
Subtotal	--	--	--	--	--	--	--
Posts (Round and split)							
Softwood	2,056	1,868	498	1,370	23	--	165
Hardwood	--	--	--	--	--	--	--
Subtotal	2,056	1,868	498	1,370	23	--	165
Other							
Softwood	293	293	163	130	--	--	--
Hardwood	825	764	322	442	33	6	22
Subtotal	1,118	1,057	485	572	33	6	22
All industrial products							
Softwood	19,863	18,206	12,107	6,099	251	370	1,036
Hardwood	28,568	25,814	17,336	8,478	1,466	152	1,136
Total	48,431	44,020	29,443	14,577	1,717	522	2,172
FUELWOOD							
Softwood	48	9	6	3	1	--	38
Hardwood	1,715	463	268	195	94	--	1,158
Total	1,763	472	274	198	95	--	1,196
ALL PRODUCTS							
Softwood	19,911	18,215	12,113	6,102	252	370	1,074
Hardwood	30,283	26,277	17,604	8,673	1,560	152	2,294
Total	50,194	44,492	29,717	14,775	1,812	522	3,368

Table 68.--Timber products from roundwood by species group and product, Eastern Upper Peninsula, Michigan, 1978

Species group	All Products	Pulpwood		Saw logs		Veneer logs	
	[1]/Thousand cubic feet	Cords	[1]/Thousand cubic feet	[2]/Thousand board feet	[1]/Thousand cubic feet	[2]/Thousand board feet	[1]/Thousand cubic feet
SOFTWOODS							
White pine	1,524	5,284	414	6,610	1,109	--	--
Red pine	1,448	11,101	876	3,150	526	27	4
Jack pine	5,667	69,015	5,450	1,108	206	--	--
White spruce	967	10,829	854	327	61	--	--
Black spruce	1,224	13,695	1,081	414	77	--	--
Balsam fir	4,024	43,827	3,459	489	93	--	--
Hemlock	2,294	23,843	1,883	2,411	404	--	--
Tamarack	124	1,217	93	152	30	--	--
Northern white-cedar	2,639	3,788	297	2,949	553	--	--
Other softwoods	--	--	--	--	--	--	--
Total	19,911	182,599	14,407	17,610	3,059	27	4
HARDWOODS							
Select white oaks	20	252	20	--	--	--	--
Select red oaks	126	637	47	286	49	212	29
Other red oaks	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--
Yellow birch	987	3,879	305	2,042	342	2,071	284
Hard maple	7,150	17,894	1,411	29,262	4,748	3,575	489
Soft maple	3,284	26,210	2,068	5,576	979	37	5
Beech	2,539	7,588	600	10,006	1,684	796	109
Ash	320	2,268	178	696	120	19	3
Balsam poplar	981	11,738	924	328	57	--	--
Cottonwood	--	--	--	--	--	--	--
Bigtooth aspen	1,531	15,635	1,235	943	165	8	1
Quaking aspen	8,599	87,722	6,930	5,293	929	47	7
Basswood	415	236	17	2,174	383	103	15
Yellow-poplar	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--
Butternut	--	--	--	--	--	--	--
Elm	1,454	5,621	446	3,875	680	9	1
Paper birch	2,788	23,867	1,881	2,256	396	854	117
Other hardwoods[3]/	89	604	45	265	44	--	--
Total	30,283	204,151	16,107	63,002	10,576	7,731	1,060
All species	50,194	386,750	30,514	80,612	13,635	7,758	1,064

(Table 68 continued on next page)

[1]/Small quantities may round off to less than 500 cubic feet and will be shown as a dash in columns showing thousand cubic feet.

[2]/International 1/4-inch rule.

[3]/Includes black cherry.

(Table 68 continued)

Species group	Fuelwood		Posts		Poles		Other Products
	Cords	1/Thousand cubic feet	Thousand pieces	1/Thousand cubic feet	Pieces	1/Thousand cubic feet	1/Thousand cubic feet
SOFTWOODS							
White pine	48	1	--	--	--	--	--
Red pine	77	3	--	--	4,024	34	5
Jack pine	106	4	--	--	590	5	2
White spruce	19	--	47	48	--	--	4
Black spruce	24	1	60	61	--	--	4
Balsam fir	49	1	450	463	--	--	8
Hemlock	184	7	--	--	--	--	--
Tamarack	52	1	--	--	--	--	--
Northern white-cedar	476	30	1,442	1,484	--	--	275
Other softwoods	--	--	--	--	--	--	--
Total	1,035	48	1,999	2,056	4,614	39	298
HARDWOODS:							
Select white oaks	5	--	--	--	--	--	--
Select red oaks	46	1	--	--	--	--	--
Other red oaks	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--
Yellow birch	828	56	--	--	--	--	--
Hard maple	7,175	502	--	--	--	--	--
Soft maple	2,483	173	--	--	--	--	59
Beech	2,032	144	--	--	--	--	2
Ash	363	19	--	--	--	--	--
Balsam poplar	--	--	--	--	--	--	--
Cottonwood	--	--	--	--	--	--	--
Bigtooth aspen	313	22	--	--	--	--	108
Quaking aspen	1,756	124	--	--	--	--	609
Basswood	7	--	--	--	--	--	--
Yellow-poplar	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--
Butternut	--	--	--	--	--	--	--
Elm	4,697	327	--	--	--	--	--
Paper birch	4,973	347	--	--	--	--	47
Other hardwoods	18	--	--	--	--	--	--
Total	24,696	1,715	--	--	--	--	825
All species	25,731	1,763	1,999	2,056	4,614	39	1,123

Table 69.--Volume of primary plant residue by use and type, Eastern Upper Peninsula, Michigan, 1978

(In thousand cubic feet)

Use	Wood residue						Bark[3]	
	Total		Coarse[1]		Fine[2]			
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Fiber products[4]	516.5	2,825.3	474.9	2,600.3	41.6	225.0	15.5	166.5
Charcoal	--	--	--	--	--	--	--	--
Industrial fuel	160.9	1,169.7	35.7	231.2	125.2	938.5	292.2	1,188.9
Domestic fuel	170.6	419.9	170.6	398.9	--	21.0	60.9	182.8
Miscellaneous[5]	140.9	526.5	11.1	--	129.8	526.5	59.0	187.6
Not used[6]	393.1	541.9	180.6	198.8	212.5	395.1	331.6	391.8
Total	1,382.0	5,483.3	872.9	3,377.2	509.1	2,106.1	759.2	2,117.6

1/Suitable for chipping such as slabs, edgings, veneer cores, etc.
2/Not suitable for chipping such as sawdust, veneer clippings, etc.
3/Does not include bark disposal at pulpmills.
4/For manufacture of pulp, hardboard, or roofing felt.
5/Livestock bedding, mulch, small dimension, and specialty items.
6/Includes residue burned as waste.

Table 70.--All live shrub[1/] biomass yields on commercial forest land by shrub species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In pounds per acre)

Shrub species group	Forest type														
	Jack pine	Red pine	White pine	Balsam fir	White spruce	Black spruce	Northern white-cedar	Tamarack	Oak-hickory	Elm-ash-soft maple	Maple-birch	Aspen	Paper birch	Exotic	Non-stocked
TALL SHRUBS															
Balsam fir	--	107.2	123.6	825.2	130.8	414.4	376.0	--	--	107.2	106.0	356.8	574.4	--	--
Tamarack	--	--	--	16.8	--	--	18.8	--	--	--	--	--	--	--	--
White spruce	--	--	--	89.6	419.6	--	12.0	--	--	--	7.2	24.4	148.0	--	--
Black spruce	65.2	--	10.4	137.6	--	672.4	74.4	--	--	--	--	13.6	--	--	--
Jack pine	461.2	10.0	--	--	--	--	--	--	--	--	--	6.0	--	--	16.4
Red pine	--	53.2	--	--	--	--	--	--	--	--	--	--	--	--	--
White pine	16.4	--	9.6	16.8	--	4.4	--	--	--	--	--	--	--	--	--
Northern white-cedar	--	--	--	459.6	--	--	617.2	4.8	--	--	81.6	80.4	--	--	--
Hemlock	--	--	--	--	--	--	--	--	--	--	18.8	--	6.0	--	--
Striped maple	--	--	--	--	--	--	--	--	9.2	--	24.0	8.4	16.8	--	--
Red maple	--	136.0	124.8	25.2	9.2	58.8	66.4	--	--	224.4	111.2	592.8	6.0	--	--
Sugar maple	--	--	102.8	41.2	64.0	--	17.6	--	--	41.6	350.0	46.8	4.0	--	--
Mountain maple	--	--	--	114.4	13.6	--	17.2	14.0	--	276.4	17.6	44.4	--	--	--
Green alder	--	--	--	--	--	--	--	--	--	--	--	--	234.0	--	--
Speckled alder	144.8	212.4	310.4	466.8	--	899.2	588.4	2,645.2	--	457.6	21.6	137.2	554.4	--	6.8
Yellow birch	--	--	--	--	--	--	--	--	--	--	10.8	--	--	--	--
Paper birch	--	--	--	8.0	--	--	9.6	--	--	14.8	--	16.0	--	--	--
Dogwood	--	--	--	95.6	23.2	42.0	49.2	--	--	14.8	--	89.6	76.0	--	--
Hawthorn	--	--	--	--	--	--	--	--	--	--	--	--	--	--	170.0
Beech	--	--	--	--	--	--	--	--	--	18.8	118.0	--	--	--	--
White ash	--	--	--	--	--	--	--	--	--	15.2	--	23.6	25.2	--	--
Black ash	--	--	--	6.0	10.8	--	107.2	--	--	43.6	4.0	56.4	--	--	--
Green ash	--	--	--	--	--	--	10.4	--	--	--	12.8	--	--	--	--
Black alder	--	--	--	--	--	--	113.2	--	--	4.8	--	--	--	--	--
Mountain holly	--	--	--	--	--	4.4	--	--	--	--	--	--	--	--	--
Eastern hophornbeam	--	--	--	--	--	--	--	--	--	--	14.0	--	--	--	--
Balsam poplar	--	--	--	57.6	216.0	--	24.4	--	--	--	8.0	35.6	--	--	--
Bigtooth aspen	--	46.4	--	--	--	--	--	--	256.0	--	--	8.0	--	--	--
Quaking aspen	--	86.4	--	5.6	--	5.2	7.6	--	--	--	23.6	186.4	18.4	--	--
Black cherry	--	--	4.8	--	82.0	--	--	--	4.4	--	48.4	11.6	6.8	--	--
Chokecherry	--	--	6.4	--	--	--	4.4	--	--	4.4	--	41.6	--	--	--
Sandcherry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	58.8
Northern red oak	--	--	--	--	--	--	--	--	15.2	--	--	5.6	--	--	--
Sweet gale	--	--	--	81.2	--	--	6.0	--	--	--	--	--	--	--	--
Mountain ash	--	--	--	--	--	22.4	--	--	--	--	--	6.4	--	--	--
Witch hazel	--	--	--	22.8	--	43.6	--	--	--	--	--	--	--	--	--
Juneberry	4.0	--	224.4	14.8	--	--	--	--	--	6.8	18.0	12.4	40.4	--	--
Hazel	--	--	14.8	148.8	--	--	342.0	--	--	199.6	124.4	122.0	--	--	--
Leatherwood	--	--	--	--	--	--	--	--	--	--	--	4.8	--	--	--
Viburnum	129.6	119.6	--	500.4	--	382.0	15.6	1,198.0	--	5.6	11.6	15.2	--	--	--
Elder	--	--	--	--	--	--	--	--	--	--	8.8	--	--	--	--
Buffaloberry	--	--	--	8.0	--	--	--	--	--	--	--	--	--	--	--
Buttonbush	--	--	--	4.4	--	--	--	--	--	--	--	--	--	--	--
Willow	--	148.4	--	150.0	--	--	95.6	53.2	--	--	--	35.2	48.8	--	--
American elm	--	--	--	--	--	--	--	--	--	--	16.4	--	--	--	--
Total	821.2	919.6	932.0	3,296.4	969.2	2,548.8	2,573.2	3,915.2	284.8	1,435.6	1,156.8	1,981.2	1,759.2	--	252.0

(Table 70 continued on next page)

(Table 70 continued)

Shrub species group	Forest type														
	Jack pine	Red pine	White pine	Balsam fir	White spruce	Black spruce	Northern white-cedar	Tamarack	Oak-hickory	Elm-ash-soft maple	Maple-birch	Aspen	Paper birch	Exotic	Non-stocked
LOW SHRUBS															
Yew	--	--	--	--	9.9	--	2.3	--	--	--	2.0	--	--	--	--
Holly	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Spirea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.0
Labrador tea	62.7	--	12.2	--	--	78.5	7.5	133.1	--	--	--	--	--	--	--
Leatherleaf	52.2	--	223.0	159.7	--	369.0	--	--	--	--	2.2	--	359.1	--	--
Bog laurel	--	--	--	--	--	2.9	--	--	--	--	--	--	--	--	--
Sweetfern	60.5	20.0	--	--	17.1	2.4	--	--	223.8	--	--	--	--	--	19.5
Gooseberry-currant	--	--	--	9.1	--	--	1.7	--	--	7.3	--	10.8	1.4	--	95.6
Chokeberry	--	--	--	--	--	--	--	--	--	1.5	--	--	--	--	--
Raspberry-blackberry	--	122.4	31.2	45.3	--	--	9.4	--	--	49.9	32.9	35.0	5.5	--	244.8
Rose	--	--	1.3	3.0	2.7	2.2	1.0	--	--	--	--	--	1.1	--	--
Black huckleberry	20.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bilberry-blueberry	401.5	334.1	157.3	25.2	--	183.0	17.6	--	--	6.3	7.7	56.1	14.8	--	32.8
Bush honeysuckle	--	--	--	--	3.9	--	--	--	--	--	--	--	--	--	--
Honeysuckle	--	--	--	24.7	11.1	3.8	8.3	--	--	3.8	2.5	9.9	6.9	--	--
Snowberry	--	--	--	4.4	5.9	--	1.0	--	--	--	--	--	--	--	--
Shrubby cinquefoil	--	--	--	--	--	--	1.1	--	--	--	--	--	--	--	--
St.Johns wort	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	598.0	476.5	425.0	271.4	50.6	641.8	49.9	133.1	223.8	68.8	47.3	111.8	388.8	--	396.7
All shrubs	1,419.2	1,396.1	1,357.0	3,567.8	1,019.8	3,190.6	2,623.1	4,048.3	508.6	1,504.4	1,204.1	2,093.0	2,148.0	--	648.7
Number of plots[2/]	39	12	17	38	8	29	101	3	2	34	280	106	20	--	10

[1/] Trees under 1.0-inch d.b.h. are also included. Tree and shrub species that averaged less than 1.0 pound per acre are not included.

[2/] Number of plots by forest type from which average yields were derived.

Table 71.--All live tree biomass yields on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In pounds per acre)

Shrub species group	Forest type														
	Jack pine	Red pine	White pine	Balsam fir	White spruce	Black spruce	Northern white-cedar	Tamarack	Oak-hickory	Elm-ash-soft maple	Maple-birch	Aspen	Paper birch	Exotic	Non-stocked
SOFTWOODS															
White pine	2,512	4,304	51,032	2,840	6,392	3,290	2,364	502	1,836	1,188	1,780	916	818	--	926
Red pine	7,282	63,600	8,006	68	4,202	996	34	370	1,314	32	64	560	782	15,710	834
Jack pine	59,466	12,922	2,194	--	1,790	4,640	--	--	112	8	58	1,054	--	--	910
White spruce	92	530	2,198	16,722	38,378	232	1,980	52	978	1,338	1,084	2,984	3,170	28,672	48
Black spruce	3,592	778	4,322	3,344	1,412	37,778	6,948	5,696	--	1,142	334	1,070	352	--	1,068
Balsam fir	46	932	2,384	33,594	14,068	4,050	14,328	2,890	414	10,664	5,314	13,098	9,912	--	360
Hemlock	--	--	2,388	1,662	522	536	1,196	--	--	4,658	9,630	618	1,298	--	18
Tamarack	34	158	648	546	402	1,836	3,394	50,404	--	1,456	8	326	130	--	590
Northern white-cedar	30	124	1,886	9,118	15,980	2,414	67,716	6,758	--	8,010	1,996	4,540	9,550	--	204
Other softwoods	--	170	--	28	--	--	--	--	--	--	--	--	--	126,494	--
Total	73,054	83,518	75,058	67,922	83,146	55,772	97,960	66,672	4,654	28,496	20,268	25,166	26,012	170,876	4,958
HARDWOODS															
Select white oaks	--	--	--	--	--	--	--	--	1,212	--	--	8	226	--	--
Select red oaks	608	76	36	--	--	--	--	--	71,468	210	530	450	848	--	--
Other red oaks	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Yellow birch	--	--	--	1,950	1,044	30	1,794	--	--	6,570	8,510	400	974	--	--
Hard maple	120	1,410	1,920	1,082	1,066	174	438	--	3,564	2,034	53,306	2,318	4,746	--	304
Soft maple	906	1,602	8,854	6,672	7,526	1,262	4,248	160	18,920	36,832	30,396	7,148	10,694	--	272
Beech	--	44	1,008	128	956	--	--	--	--	432	17,506	106	156	--	62
Ash	--	--	--	1,858	404	--	3,440	--	--	22,640	1,920	2,350	2,918	--	--
Balsam poplar	--	6	452	2,570	2,846	170	1,918	638	--	1,700	396	8,516	2,320	--	464
Cottonwood	--	--	--	--	--	--	--	--	--	--	26	--	--	--	--
Bigtooth aspen	412	1,594	812	196	--	502	122	--	3,444	346	1,068	5,576	1,514	--	64
Quaking aspen	622	5,252	4,588	9,930	15,242	5,512	2,334	1,016	7,348	3,354	3,400	36,572	8,608	--	220
Basswood	--	--	--	42	228	--	42	--	1,402	224	3,332	474	50	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	68	886	100	130	200	26	16	--	322	448	4,650	550	162	--	132
Butternut	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm	--	--	90	422	354	--	160	--	--	3,446	2,558	988	60	--	412
Paper birch	1,328	838	6,032	8,436	5,484	2,890	9,764	1,360	3,170	5,710	3,132	10,588	53,840	--	198
Other hardwoods	--	--	--	4	--	--	2	--	--	--	10	14	--	--	--
Noncommercial species	--	--	--	144	--	--	114	--	1,598	148	1,464	316	1,090	--	198
Total	4,064	11,708	23,892	33,564	35,350	10,566	24,392	3,174	112,448	84,094	132,204	76,374	88,206	--	2,326
All species	77,118	95,226	98,950	101,486	118,496	66,338	122,352	69,846	117,102	112,590	152,472	101,540	114,218	170,876	7,284
Number of plots[1/]	103	42	41	115	20	112	365	28	14	127	660	365	58	1	34

[1/] Number of plots by forest type from which average yields were derived.

Table 72.--All live tree biomass on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In green tons)

Species group	All types	Forest type						
		Jack pine	Red pine	White pine	Balsam fir	White spruce	Black spruce	Northern white-cedar
SOFTWOODS								
White pine	5,462,394	287,770	300,790	1,752,940	308,767	96,204	465,662	703,389
Red pine	6,093,763	834,052	4,445,686	274,988	7,326	63,236	140,917	9,880
Jack pine	8,881,336	6,811,776	903,243	75,330	--	26,939	656,721	--
White spruce	5,102,551	10,623	36,996	75,466	1,817,694	577,598	32,955	588,966
Black spruce	9,240,903	411,484	54,315	148,436	363,414	21,246	5,347,386	2,066,431
Balsam fir	17,975,038	5,197	65,177	81,882	3,651,763	211,711	573,122	4,261,829
Hemlock	7,014,677	--	--	82,049	180,592	7,844	75,922	355,481
Tamarack	2,748,882	3,925	11,059	22,263	59,425	6,047	259,945	1,009,478
Northern white-cedar	25,922,400	3,319	8,683	64,753	991,149	240,484	341,765	20,142,187
Other softwoods	90,800	--	11,868	--	3,036	--	--	--
Total	88,532,744	8,368,146	5,837,817	2,578,107	7,383,166	1,251,309	7,894,395	29,137,641
HARDWOODS								
Select white oaks	26,932	--	--	--	--	--	--	--
Select red oaks	1,291,739	69,675	5,308	1,213	--	--	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	6,519,790	--	--	--	211,861	15,722	4,176	533,355
Hard maple	32,667,429	13,767	98,615	65,932	117,554	16,031	24,711	130,420
Soft maple	27,148,551	103,798	112,032	304,129	725,258	113,276	178,518	1,263,289
Beech	10,308,596	--	3,081	34,620	13,824	14,389	--	--
Ash	5,467,113	--	--	--	201,884	6,089	--	1,023,417
Balsam poplar	4,335,390	--	373	15,489	279,429	42,834	23,984	570,238
Cottonwood	15,581	--	--	--	--	--	--	--
Bigtooth aspen	2,957,672	47,249	111,410	27,876	21,289	--	71,171	36,317
Quaking aspen	18,523,137	71,136	367,156	157,590	1,079,354	229,387	780,152	693,971
Basswood	2,149,372	--	--	--	4,540	3,421	--	12,183
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	3,038,140	7,877	61,937	3,450	14,178	3,007	3,693	4,565
Butternut	--	--	--	--	--	--	--	--
Elm	2,259,518	--	--	3,105	45,927	5,319	--	47,467
Paper birch	13,688,603	152,127	58,535	207,189	917,066	82,523	409,110	2,904,221
Other hardwoods	11,435	--	--	--	461	--	--	670
Noncommercial species	1,098,964	--	--	--	15,614	--	--	33,683
Total	131,507,962	465,629	818,447	820,593	3,648,239	531,998	1,495,515	7,253,796
All species	220,040,706	8,833,775	6,656,264	3,398,700	11,031,405	1,783,307	9,389,910	36,391,437

(Table 72 continued on next page)

(Table 72 continued)

Species group	Forest type							
	Tamarack	Oak-hickory	Elm-ash-soft maple	Maple-birch	Aspen	Paper birch	Exotic	Non-stocked
SOFTWOODS								
White pine	10,982	17,718	113,863	1,033,176	307,343	45,182	--	18,608
Red pine	8,118	12,683	3,004	36,606	187,869	43,229	9,426	16,743
Jack pine	--	1,086	670	33,258	354,041	--	--	18,272
White spruce	1,121	9,431	128,330	628,668	1,001,415	175,134	17,203	951
Black spruce	124,725	--	109,523	193,980	359,126	19,388	--	21,449
Balsam fir	63,282	3,991	1,022,616	3,082,641	4,396,930	547,651	--	7,246
Hemlock	--	--	446,769	5,586,235	207,720	71,718	--	347
Tamarack	1,103,856	--	139,680	4,792	109,328	7,215	--	11,869
Northern white-cedar	147,997	--	768,096	1,158,118	1,524,167	527,592	--	4,090
Other softwoods	--	--	--	--	--	--	75,896	--
Total	1,460,081	44,909	2,732,551	11,757,474	8,447,939	1,437,109	102,525	99,575
HARDWOODS								
Select white oaks	--	11,704	--	--	2,795	12,433	--	--
Select red oaks	--	689,657	20,096	307,782	151,167	46,841	--	--
Other red oaks	--	--	--	--	--	--	--	--
Hickory	--	--	--	--	--	--	--	--
Yellow birch	--	--	630,009	4,936,879	133,970	53,818	--	--
Hard maple	--	34,383	195,048	30,924,850	777,846	262,169	--	6,103
Soft maple	3,482	182,586	3,532,156	17,634,000	2,399,719	590,832	--	5,476
Beech	--	--	41,384	10,155,585	35,824	8,626	--	1,263
Ash	--	--	2,171,220	1,114,394	788,947	161,162	--	--
Balsam poplar	13,974	--	163,090	229,589	2,858,870	128,215	--	9,305
Cottonwood	--	--	--	15,581	--	--	--	--
Bigtooth aspen	--	33,237	33,076	619,502	1,871,622	83,654	--	1,269
Quaking aspen	22,249	70,911	321,659	1,972,418	12,277,131	475,594	--	4,429
Basswood	--	13,534	21,400	1,932,766	158,794	2,734	--	--
Yellow-poplar	--	--	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--	--	--
Black cherry	--	3,110	42,994	2,697,094	184,676	8,903	--	2,656
Butternut	--	--	--	--	--	--	--	--
Elm	--	--	330,438	1,483,816	331,815	3,364	--	8,267
Paper birch	29,761	30,594	547,634	1,816,706	3,554,532	2,974,625	--	3,980
Other hardwoods	--	--	--	5,831	4,473	--	--	--
Noncommercial species	--	15,429	14,232	849,626	106,154	60,264	--	3,962
Total	69,466	1,085,145	8,064,436	76,696,419	25,638,335	4,873,234	--	46,710
All species	1,529,547	1,130,054	10,796,987	88,453,893	34,086,274	6,310,343	102,525	146,285

Table 73.--All live tree biomass by species group and tree biomass component, Eastern Upper Peninsula, Michigan, 1980

Species group	All components	Biomass component				
		1- to 5-inch trees	Growing stock		Cull	
			Boles	Tops and limbs	Boles	Tops and limbs
			-Green tons-			
SOFTWOODS						
White pine	5,462,394	309,642	3,308,127	1,562,994	167,726	113,905
Red pine	6,093,763	994,027	3,516,397	1,569,077	9,294	4,968
Jack pine	8,881,336	1,047,822	5,155,181	2,421,314	160,684	96,335
White spruce	5,102,551	582,139	2,970,701	1,412,321	87,675	49,715
Black spruce	9,240,903	4,502,176	3,183,767	1,507,419	25,436	22,105
Balsam fir	17,975,038	7,999,098	6,635,333	3,077,692	142,984	119,931
Hemlock	7,014,677	593,060	3,974,008	1,874,061	352,136	221,412
Tamarack	2,748,882	1,065,176	1,087,483	525,412	32,627	38,184
Northern white-cedar	25,922,400	10,809,314	8,855,169	4,298,399	1,024,587	934,931
Other softwoods	90,800	34,198	37,556	17,458	1,017	571
Total	88,532,744	27,936,652	38,723,722	18,266,147	2,004,166	1,602,057
HARDWOODS						
Select white oaks	26,932	2,795	12,841	5,586	3,768	1,942
Select red oaks	1,291,739	62,708	769,291	351,653	67,898	40,189
Other red oaks	--	--	--	--	--	--
Hickory	--	--	--	--	--	--
Yellow birch	6,519,790	444,991	3,241,174	1,623,135	683,406	527,084
Hard maple	32,667,429	5,428,038	17,112,973	8,063,379	1,252,996	810,043
Soft maple	27,148,551	5,183,125	13,226,831	6,434,481	1,378,963	925,151
Beech	10,308,596	827,292	5,140,263	2,528,948	1,072,875	739,218
Ash	5,467,113	2,264,135	1,998,694	893,471	179,656	131,157
Balsam poplar	4,335,390	772,566	2,239,502	1,089,790	129,657	103,875
Cottonwood	15,581	--	10,509	5,072	--	--
Bigtooth aspen	2,957,672	179,228	1,748,609	802,296	133,715	93,824
Quaking aspen	18,523,137	2,720,606	9,296,094	4,329,442	1,272,753	904,242
Basswood	2,149,372	183,500	1,274,007	559,389	79,041	53,435
Yellow-poplar	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--
Black cherry	3,038,140	536,166	1,386,829	630,215	303,433	181,497
Butternut	--	--	--	--	--	--
Elm	2,259,518	189,962	1,278,000	587,441	121,596	82,519
Paper birch	13,688,603	2,230,151	7,144,605	3,379,362	577,647	356,838
Other hardwoods	11,435	1,131	7,088	3,216	--	--
Noncommercial species	1,098,964	643,934	--	--	294,640	160,390
Total	131,507,962	21,670,328	65,887,310	31,286,876	7,552,044	5,111,404
All species	220,040,706	49,606,980	104,611,032	49,553,023	9,556,210	6,713,461

(Table 73 continued on next page)

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(Table 73 continued)

Species group	All components	Biomass component				
		1- to 5-inch trees	Growing stock		Cull	
			Boles	Tops and limbs	Boles	Tops and limbs
			Thousand cubic feet			
SOFTWOODS						
White pine	301,754	17,131	182,766	86,344	9,241	6,272
Red pine	296,651	48,196	171,311	76,445	455	244
Jack pine	374,254	43,614	217,430	102,191	6,873	4,146
White spruce	289,538	32,983	168,613	80,161	4,967	2,814
Black spruce	565,425	274,942	195,203	92,417	1,535	1,328
Balsam fir	820,483	365,256	302,611	140,365	6,645	5,606
Hemlock	296,626	24,685	167,929	79,262	15,161	9,589
Tamarack	120,172	46,821	47,306	22,855	1,463	1,727
Northern white-cedar	1,769,925	736,580	608,270	295,256	68,140	61,679
Other softwoods	4,334	1,625	1,797	835	49	28
Total	4,839,162	1,591,833	2,063,236	976,131	114,529	93,433
HARDWOODS						
Select white oaks	950	96	452	197	135	70
Select red oaks	45,243	2,153	26,917	12,305	2,422	1,446
Other red oaks	--	--	--	--	--	--
Hickory	--	--	--	--	--	--
Yellow birch	245,295	16,481	121,283	60,776	26,356	20,399
Hard maple	1,239,681	204,254	649,568	306,088	48,393	31,378
Soft maple	1,176,786	223,652	573,018	278,800	60,543	40,773
Beech	403,435	32,159	200,526	98,666	42,632	29,452
Ash	221,188	89,909	81,630	36,497	7,511	5,641
Balsam poplar	220,227	39,068	113,778	55,375	6,653	5,353
Cottonwood	666	--	449	217	--	--
Bigtooth aspen	141,711	8,515	83,724	38,419	6,494	4,559
Quaking aspen	884,494	129,245	443,491	206,558	61,468	43,732
Basswood	107,028	9,084	63,420	27,848	3,975	2,701
Yellow-poplar	--	--	--	--	--	--
Black walnut	--	--	--	--	--	--
Black cherry	137,885	24,017	62,888	28,583	13,947	8,450
Butternut	--	--	--	--	--	--
Elm	88,920	7,385	50,171	23,062	4,900	3,402
Paper birch	569,561	92,827	296,978	140,480	24,264	15,012
Other hardwoods	482	47	299	136	--	--
Noncommercial species	46,262	26,803	--	--	12,595	6,864
Total	5,529,814	905,695	2,768,592	1,314,007	322,288	219,232
All species	10,368,976	2,497,528	4,831,828	2,290,138	436,817	312,665

Table 74.--Sampling errors[1/] for estimates smaller than the Unit totals of volume, net growth, removals, and area of commercial forest land, Eastern Upper Peninsula, Michigan, 1980

Sampling error	Commercial forest area	Growing Stock			Sawtimber		
		Inventory	Growth	Removals	Inventory	Growth	Removals
Percent	Thousand acres	Million cubic feet			[2/]Million board feet		
1	857.6	7,849.5	952.6	9,932.3	41,659.4	6,262.7	54,593.4
2	214.4	1,962.4	238.1	2,483.1	10,414.8	1,565.7	13,648.4
3	95.3	872.2	105.8	1,103.6	4,628.8	695.9	6,065.9
4	53.6	490.6	59.5	620.8	2,603.7	391.4	3,412.1
5	34.3	314.0	38.1	397.3	1,666.4	250.5	2,183.7
10	8.6	78.5	9.5	99.3	416.6	62.6	545.9
15	3.8	34.9	4.2	44.1	185.2	27.8	242.6
20	2.1	19.6	2.4	24.8	104.1	15.7	136.5
25	1.4	12.6	1.5	15.9	66.7	10.0	87.3
50	0.3	3.1	0.4	4.0	16.7	2.5	21.8
100	0.1	0.8	0.1	1.0	4.2	0.6	5.5

1/At the 68-percent probability level.
2/International 1/4-inch rule.

Smith, W. Brad.
Timber resource of Michigan's Eastern Upper Peninsula, 1980. Resour. Bull. NC-64. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1982. 103 p.

The fourth inventory of the timber resource of Michigan's Eastern Upper Peninsula Survey Unit shows a 9 percent decline in commercial forest area and a 19 percent gain in growing-stock volume between 1966 and 1980. Presented are highlights and statistics on area, volume, growth, mortality, removals, utilization, and biomass.

KEY WORDS: Statistics, area, volume, growth, mortality, removals.